EVS 3100 HSI Series

HYDAC Self Identification

Applications

Description

The flow rate transmitters in the series EVS 3100-H and EVS 3110-H with HSI sensor recognition have been specially developed for use in conjunction with HYDAC measuring instruments HMG 500, HMG 510, HMG 3000 and CMU 1000.

For data transmission, the EVS 31x0-H has an HSI interface *(HYDAC Sensor Interface)*.

The HSI sensors are recognised automatically via the HSI interface by the above-mentioned HYDAC measuring instruments, and all the necessary basic settings are taken from each sensor.

As with all flow rate transmitters in the series EVS 3100 and EVS 3110, the EVS 31x0-H also operates according to the turbine principle. The speed of an impeller turning in the fluid flow is measured and converted into an electronic signal.

Special Features

- Fully automatic recognition by and voltage supply from HYDAC measuring instruments HMG 500, HMG 510, HMG 3000 or CMU 1000
- Automatic transfer of measuring range, measured value and measurement unit
- Viscosities of 1 to 100 cSt
- Output signal 4 to 20 mA
- Additional connection of temperature and / or pressure transmitters possible

Approvals

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Technical Details

Housing material - EVS 3100 EVS 3110	Aluminum Stainless Steel
Measurement medium - EVS 3100 EVS 3110	Hydraulic oils* Water based fluids*
Supply voltage	from HMG 500/510/3000
CE mark	EN 61000-6-1 / 2 / 3 / 4
Compensated temperature range	-4° to 150°F (-20° to 70°C)
Operating temperature	-4° to 158°F (-20° to 70°C)
Media temperature range	-4° to 194°F (-20° to 90°C)
Storage temperature	-40° to 212°F(-40° to 100°C)
Permissible viscosity range	1 to 100 cSt
Calibrated at - EVS 3100 EVS 3110	30 cSt 5 cSt
Accuracy class	≤ ±2% of the instantaneous value
Measuring ranges / Operating pressure EVS 31XX-A-0020-000 EVS 31XX-A-0060-000 EVS 31XX-A-0300-000 EVS 31XX-A-0600-000	 0.26 to 5.28 gpm / 5800psi 1.59 to 15.9 gpm / 5800 psi 3.96 to 79.3 gpm / 5800 psi 10.6 to 159 gpm / 4567 psi *(5800 psi max for EVS 3110)*
Protection class to DIN 40050	IP 67 *(M12x1, with ZBE 08 molded cable)*
Mechanical connection/ Torque rating EVS 31XX-A-0020-000 EVS 31XX-A-0060-000 EVS 31XX-A-0300-000 EVS 31XX-A-0600-000	 G1/4 female thread / approx. 44 lb-ft (60 Nm) G1/2 female thread / approx. 95 lb-ft (130 Nm) G1 1/4 female thread / approx. 370 lb-ft (500 Nm) G1 1/2 female thread / approx. 440 lb-ft (600 Nm)
Additional connections on housing	2 x G 1/4 female ports for pressure or temperature sensors

*other fluids on request
**other ranges on request

Model Code

EVS 3 1 X 8 - H - XXXX - 000

Housing Material
0 = Aluminum
1 = Stainless Steel

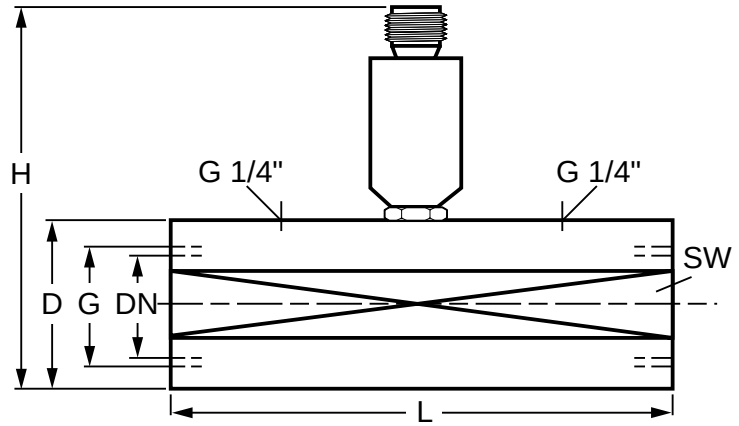
Electrical Connection
8 = M12x1, 5 pole *(connector not supplied)*

Signal
H = HSI (Automatic Sensor Identification)

Measuring Range
0020 = 0.26 to 5.28 gpm
0060 = 1.59 to 15.9 gpm
0300 = 3.96 to 29.3 gpm
0600 = 10.6 to 159 gpm

Modification Number
000 = Standard

Dimensions



Model	Meas. Range gpm (l/min)	Material	L	H	D / SW*	G	DN	Pmax in bar	Tmax
EVS 310X-H-0020	0.26 - 5.28 (1.2 - 20)	AL/SS	117	135	47.0 / 46	G 1/4	7	400	-20 to 90°C
EVS 310X-H-0060	1.59 - 15.9 (6 - 60)	AL/SS	144	135	48.5 / 46	G 1/2	11	400	-20 to 90°C
EVS 310X-H-0300	3.96 - 79.3 (15 - 300)	AL/SS	155	150	63.5 / 60	G 1 1/4	22	400	-20 to 90°C
EVS 310X-H-0600	10.6 - 159 (40 - 600)	AL/SS	181	150	63.5 / 60	G 1 1/2	30	315(A) 400(S)	-20 to 90°C

HDA 4100 ATEX Series

Absolute Pressure Transducer - Intrinsically Safe with ATEX Approval

Applications

Description

The pressure transmitter HDA 4100 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4100 in ATEX version has a ceramic measurement cell with thick-film strain gauge for measuring absolute pressure in the low pressure range.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust, e.g. in mills.

Special Features

- Accuracy ≤ ±0.5 % BFSL typ.
- Certificates:
  KEMA 05ATEX1016 X
  KEMA 05ATEX1021
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

ATEX Approvals

1. I M1 EEx ia

2. II 1G EEx ia IIC T6
3. II 1/2 G EEx ia IIC T6
4. II 3G EEx nA II T4 IP65
5. II 3G EEx nL IIC T4
6. II 2G EEx ia IIC T6

7. II 1D IP6X T80°C
8. II 3D IP6X T80°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Technical Details

Sensor Specifications		
Measuring ranges - psi	15, 50	
Overload pressure - psi	45, 150	
Burst pressure - psi	70, 250	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)* other connections upon request	
Tightening torque	G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40Nm)	
Parts in contact with media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM	
Accuracy (b.F.S.L.) including Linearity, hysteresis, and repeatability	≤ ±0.5% BFSL	
Temperature compensation zero point	≤ ±0.012% FS / °F typ.	≤ ±0.017% FS / °F max.
Temperature compensation over range	≤ ±0.012% FS / °F typ.	≤ ±0.017% FS/ °F max.
Rise time	≤ 2 ms	
Long-term drift	≤ ± 0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approx. 150 g	
Output signal	4 to 20 mA, 2 wire, R_{Lmax} = (UB - 10V) / 20 mA [kΩ]	
Environmental Condition		
Compensated temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Operating temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Ambient temperature	T6/T80: -4° to 140°F	T4: -4° to 185°F
Media temperature range	T6/T80: 140°F	T4: 185°F
Storage temperature range	-40° to 212°F	
CE mark	EN 61000-6-1/2/3/4, EN 60079-0/11/26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 65 *(DIN 43650 and M18x1 connectors)* IP 67 *(ZBE 06 molded cable)*	
Electrical Specifications		
Supply voltage	12 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
Max supply current	100 mA	
Max supply power	up to 28V: 1 W	
Max capacitance of transmitter	≤ 12 nF	
Max inductance of transmitter	0 H	
Isolation voltage	125 VAC to housing *(standard)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Model Code

HDA 4 1 X X - A - XXXX - A X X - 000 - X1 (PSI)

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar only)*
8 = 1/4"-18 NPT *(psi only)*
Other connections upon request

Electrical Connection
4 = 4 pole plug M18x1, Binder Series *(connector not included)*
5 = DIN 43650/ISO 4400 plug, 3 pole + ground *(incudes ZBE 01)*
6 = M12x1 plug, 4 pole *(connector not included)*

Output Signal
A = 4-20mA, 2-wire

Pressure Range
For HDA 418X *(1/4"-18 NPT only)*
0015, 0050 psi

Approval
A = ATEX *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

Types of Protection and Application Areas *(see chart below)*
1 = I M1 EEx ia
II 1G EEx ia IIC T6
II 1/2 G EEx ia IIC T6
II 2G EEx ia IIC T6
7 = II 3G EEx nL IIC T4
Other protection types upon request

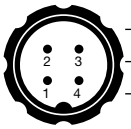
Modification Number
000 = Standard

Seal Material
F1 FPM Seal *(hydraulic oil)*
E1 EPDM Seal *(coolant, ammonia, water)*

(psi)
psi version *(leave blank for bar version)*

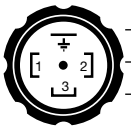
Pin Connections

Binder 714 M18



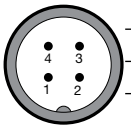
Pin	41X4-A
1	nc
2	Signal +
3	Signal -
4	nc

DIN 43650



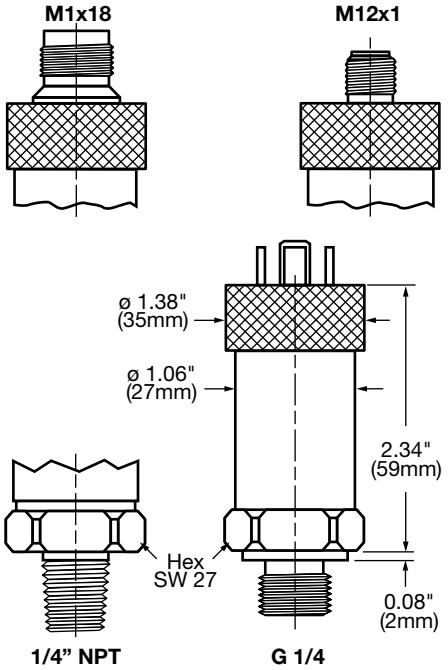
Pin	41X5-A
1	Signal +
2	Signal -
3	nc
4	PE/GND

M12x1, 4 pole



Pin	41X6-A
1	Signal +
2	nc
3	Signal -
4	nc

Dimensions



Application Areas

Code Type Code	1	1	1	7
Protection class	I M1 EEx ia	II 1G EEx ia IIC T6 II 1/2G EEx ia IIC T6	II 2G EEx ia IIC T6	II 3G EEx nL IIC T4
Certificate number	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1021
Zones / Categories	Group I Category M 1 mining Protection type: intrinsically safe ia with barrier T_a: -25° to 60°C	Group II Category 1G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 0 Retrofit in Zone 0 T_a: -25° to 60°C	Group II Category 2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 1 & 2 T_a: -25° to 60°C	Group II Category 3G Gases Protection type: nL Use in: Zone 2 T_a: -25° to 60°C
Electrical Connection *(see model code)*	4, 5, 6	4, 5, 6	4, 5, 6	4, 5, 6

HDA 4300 ATEX Series

Low Pressure Transducer - Intrinsically Safe with ATEX Approval

Applications

Description

The pressure transmitter HDA 4300 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4300 in ATEX version has a ceramic measurement cell with thickfilm strain gauge for measuring relative pressure in the low pressure range.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust, e.g. in mills.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Certificates:
  KEMA 05ATEX1016 X
  KEMA 05ATEX1021
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

ATEX Approvals

1. I M1 EEx ia

2. II 1G EEx ia IIC T6
3. II 1/2 G EEx ia IIC T6
4. II 3G EEx nA II T4 IP65
5. II 3G EEx nL IIC T4
6. II 2G EEx ia IIC T6

7. II 1D IP6X T80°C
8. II 3D IP6X T80°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Technical Details

Sensor Specifications		
Measuring ranges - psi	15, 30, 50, 100, 150, 250, 500	
Overload pressure - psi	45, 100, 150, 290, 450, 725, 1500	
Burst pressure - psi	70, 150, 250, 400, 650, 1000, 2500	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)* other connections upon request	
Tightening torque	G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40Nm)	
Parts in contact with media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL	
Temperature compensation zero point	≤ ±0.012% FS / °F typ.	≤ ±0.017% FS / °F max.
Temperature compensation over range	≤ ±0.012% FS / °F typ.	≤ ±0.017% FS/ °F max.
Rise time	≤ 2 ms	
Long-term drift	≤ ± 0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approx. 150 g	
Output signal	4 to 20 mA, 2 wire, R_{Lmax} = (UB - 10V) / 20 mA [kΩ]	
Environmental Condition		
Compensated temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Operating temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Ambient temperature	T6/T80: -4° to 140°F	T4: -4° to 185°F
Media temperature range	T6/T80: 140°F	T4: 185°F
Storage temperature range	-40° to 212°F	
CE mark	EN 61000-6-1/2/3/4, EN 60079-0/11/26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 65 *(DIN 43650 and M18x1 connectors)* IP 67 *(ZBE 06 molded cable)*	
Electrical Specifications		
Supply voltage	12 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
Max supply current	100 mA	
Max supply power	up to 28V: 1 W	
Max capacitance of transmitter	≤ 12 nF	
Max inductance of transmitter	0 H	
Isolation voltage	125 VAC to housing *(standard)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Model Code

HDA 4 3 X X - A - XXXX - A X X - 000 - X1 (PSI)

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar only)*
8 = 1/4"-18 NPT *(psi only)*
Other connections upon request

Electrical Connection
4 = 4 pole plug M18x1, Binder Series *(connector not included)*
5 = DIN 43650/ISO 4400 plug, 3 pole + ground *(incudes ZBE 01)*
6 = M12x1 plug, 4 pole *(connector not included)*

Output Signal
A = 4-20mA, 2-wire

Pressure Range
HDA 438X psi version
0015, 0030, 0050, 0100, 0150, 0250, 0500

Approval
A = ATEX *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

Types of Protection and Application Areas *(see chart below)*
1 = I M1 EEx ia
II 1G EEx ia IIC T6
II 1/2 G EEx ia IIC T6
II 2G EEx ia IIC T6
7 = II 3G EEx nL IIC T4
Other protection types upon request

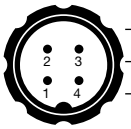
Modification Number
000 = Standard

Seal Material
F1 FPM Seal *(hydraulic oil)*
E1 EPDM Seal *(coolant, ammonia, water)*

(psi)
psi version *(leave blank for bar version)*

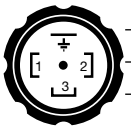
Pin Connections

Binder 714 M18



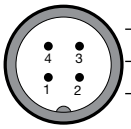
Pin	43X4-A
1	nc
2	Signal +
3	Signal -
4	nc

DIN 43650



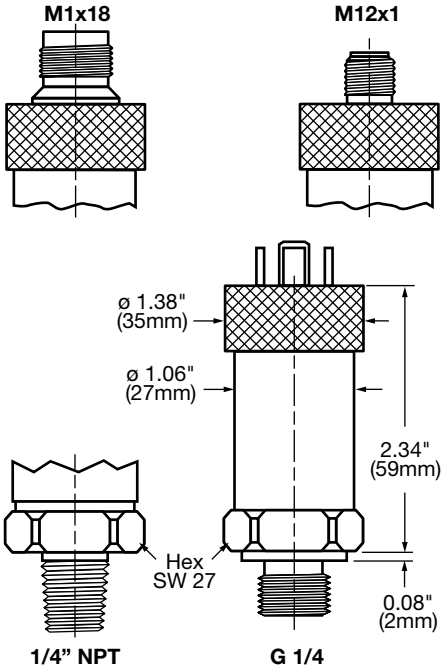
Pin	43X5-A
1	Signal +
2	Signal -
3	nc
4	PE/GND

M12x1, 4 pole



Pin	43X6-A
1	Signal +
2	nc
3	Signal -
4	nc

Dimensions



Application Areas

Code Type Code	1	1	1	7
Protection class	I M1 EEx ia	II 1G EEx ia IIC T6 II 1/2G EEx ia IIC T6	II 2G EEx ia IIC T6	II 3G EEx nL IIC T4
Certificate number	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1021
Zones / Categories	Group I Category M 1 mining Protection type: intrinsically safe ia with barrier T_a: -25° to 60°C	Group II Category 1G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 0 Retrofit in Zone 0 T_a: -25° to 60°C	Group II Category 2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 1 & 2 T_a: -25° to 60°C	Group II Category 3G Gases Protection type: nL Use in: Zone 2 T_a: -25° to 60°C
Electrical Connection *(see model code)*	4, 5, 6	4, 5, 6	4, 5, 6	4, 5, 6

HDA 4400 ATEX Series

High Pressure, Medium Accuracy Transducer Intrinsically Safe with ATEX Approval

Applications

Description

The pressure transmitter HDA 4400 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4700 in ATEX version has a stainless steel measurement cell with thin-film strain gauge for measuring relative pressure in the high pressure range.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust, e.g. in mills.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Certificates:
  KEMA 05ATEX1016 X
  KEMA 05ATEX1021
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

ATEX Approvals

1. I M1 EEx ia

2. II 1G EEx ia IIC T6
3. II 1/2 G EEx ia IIC T6
4. II 3G EEx nA II T4 IP65
5. II 3G EEx nL IIC T4
6. II 2G EEx ia IIC T6

7. II 1D IP6X T80°C
8. II 3D IP6X T80°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Technical Details

Sensor Specifications		
Measuring ranges - psi	500, 750, 1000, 1500, 3000, 6000, 9000	
Overload pressure - psi	1160, 1160, 2900, 2900, 7250, 11600, 14500	
Burst pressure - psi	2900, 2900, 7250, 7250, 14500, 29000, 29000	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* SAE 6 9/16-18 UNF2A *(psi ranges only)* other connections upon request	
Tightening torque	15 lb-ft (20 Nm)	
Parts in contact with media	Sensor: Stainless steel 1.4542 Mechanical connection: Stainless steel 1.4542, 1.4301, 1.4435, 1.4571, 1.4404, 316L, 304 Seal: FPM (SAE 6, G1/4)	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL	
Temperature compensation zero point	≤ ±0.0085% FS / °F typ. ≤ ±0.014% FS / °F max.	
Temperature compensation over range	≤ ±0.0085% FS / °F typ. ≤ ±0.014% FS / °F max.	
Rise time	≤ 2 ms	
Long-term drift	≤ ±0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approx. 150 g	
Output signal	4 to 20 mA, 2 wire, R_{Lmax} = (UB - 10V) / 20 mA [kΩ]	
Environmental Condition		
Compensated temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Operating temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Ambient temperature	T6/T80: -4° to 140°F	T4: -4° to 185°F
Media temperature range	T6/T80: 140°F	T4: 185°F
Storage temperature range	-40° to 212°F	
CE mark	EN 61000-6-1/2/3/4, EN 60079-0/11/26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 65 *(DIN 43650 and M18x1 connectors)* IP 67 *(ZBE 06 molded cable)*	
Electrical Specifications		
Supply voltage	12 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
Max supply current	100 mA	
Max supply power	up to 28V: 1 W	
Max capacitance of transmitter	≤ 12 nF	
Max inductance of transmitter	0 H	
Isolation voltage	125 VAC to housing *(standard)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Model Code

HDA 4 4 X X - A - XXXX - A X X - 000 (PSI)

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar only)*
7 = SAE 6 9/16-18 UNF2A *(psi only)*
Other connections upon request

Electrical Connection
4 = 4 pole plug M18x1, Binder Series *(connector not included)*
5 = DIN 43650/ISO 4400 plug, 3 pole + ground *(incudes ZBE 01)*
6 = M12x1 plug, 4 pole *(connector not included)*

Output Signal
A = 4-20mA, 2-wire

Pressure Range
HDA 448X psi version
0500, 0750, 1000, 1500, 3000, 5000, 6000, 9000

Approval
A = ATEX *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

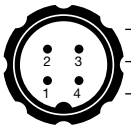
Types of Protection and Application Areas *(see chart below)*
1 = I M1 EEx ia
II 1G EEx ia IIC T6
II 1/2 G EEx ia IIC T6
II 2G EEx ia IIC T6
7 = II 3G EEx nL IIC T4
Other protection types upon request

Modification Number
000 = Standard

(psi)
psi version *(leave blank for bar version)*

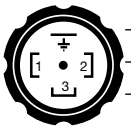
Pin Connections

Binder 714 M18



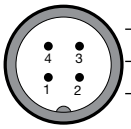
Pin	44X4-A
1	nc
2	Signal +
3	Signal -
4	nc

DIN 43650



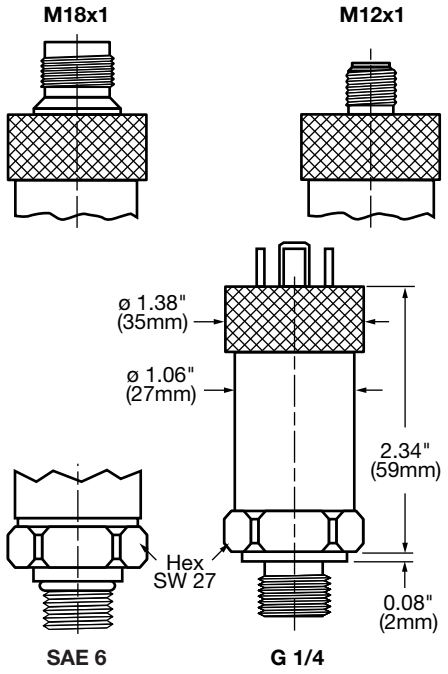
Pin	44X5-A
1	Signal +
2	Signal -
3	nc
4	PE

M12x1, 4 pole



Pin	44X6-A
1	Signal +
2	nc
3	Signal -
4	nc

Dimensions



Application Areas

Code Type Code	1	1	1	7
Protection class	I M1 EEx ia	II 1G EEx ia IIC T6 II 1/2G EEx ia IIC T6	II 2G EEx ia IIC T6	II 3G EEx nL IIC T4
Certificate number	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1021
Zones / Categories	Group I Category M 1 mining Protection type: intrinsically safe ia with barrier T_a: -25° to 60°C	Group II Category 1G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 0 Retrofit in Zone 0 T_a: -25° to 60°C	Group II Category 2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 1 & 2 T_a: -25° to 60°C	Group II Category 3G Gases Protection type: nL Use in: Zone 2 T_a: -25° to 60°C
Electrical Connection *(see model code)*	4, 5, 6	4, 5, 6	4, 5, 6	4, 5, 6

HDA 4700 ATEX Series

High Pressure Transducer with High Accuracy
Intrinsically Safe with ATEX Approval

Applications

Description

The pressure transmitter HDA 4700 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4700 in ATEX version has a stainless steel measurement cell with thin-film strain gauge for measuring relative pressure in the high pressure range.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust, e.g. in mills.

Special Features

- Accuracy ≤ ±0.25% BFSL
- Certificates:
  KEMA 05ATEX1016 X
  KEMA 05ATEX1021
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

ATEX Approvals

1. I M1 EEx ia

2. II 1G EEx ia IIC T6
3. II 1/2 G EEx ia IIC T6
4. II 3G EEx nA II T4 IP65
5. II 3G EEx nL IIC T4
6. II 2G EEx ia IIC T6

7. II 1D IP6X T80°C
8. II 3D IP6X T80°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Technical Details

Sensor Specifications		
Measuring Ranges - psi	150, 500, 750, 1000, 1500, 3000, 6000, 9000	
Overload Pressure - psi	290, 1160, 1160, 2900, 2900, 7250, 11600, 14500	
Burst Pressure - psi	1450, 2900, 2900, 7250, 7250, 14500, 29000, 29000	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* SAE 6 9/16-18 UNF2A *(psi ranges only)* other connections upon request	
Tightening torque	15 lb-ft (20 Nm)	
Parts in contact with media	Sensor: Stainless steel 1.4542 Mechanical connection: Stainless steel 1.4542, 1.4301, 1.4435, 1.4571, 1.4404, 316L, 304 Seal: FPM (SAE 6, G1/4)	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.25% BFSL	
Temperature compensation zero point	≤ ±0.0045% FS / °F typ.	≤ ±0.0085% FS / °F max.
Temperature compensation over range	≤ ±0.0045% FS / °F typ.	≤ ±0.0085% FS / °F max.
Rise time	≤ 2 ms	
Long-term drift	≤ ±0.1% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approx. 150 g	
Output signal	4 to 20 mA, 2 wire, R_{Lmax} = (UB - 10V) / 20 mA [kΩ]	
Environmental Condition		
Compensated temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Operating temperature range	T6/T80: -4° to 140°F	T4: -4° to 185°F
Ambient temperature	T6/T80: -4° to 140°F	T4: -4° to 185°F
Media temperature range	T6/T80: 140°F	T4: 185°F
Storage temperature range	-40° to 212°F	
CE mark	EN 61000-6-1/2/3/4, EN 60079-0/11/26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 65 *(DIN 43650 and M18x1 connectors)* IP 67 *(ZBE 06 molded cable)*	
Electrical Specifications		
Supply voltage	12 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
Max supply current	100 mA	
Max supply power	up to 28V: 1 W	
Max capacitance of transmitter	≤ 12 nF	
Max inductance of transmitter	0 H	
Isolation voltage	125 VAC to housing *(standard)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Model Code

HDA 4 7 X X - A - XXXX - A X X - 000 (PSI)

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar only)*
7 = SAE 6 9/16-18 UNF2A *(psi only)*
Other connections upon request

Electrical Connection
4 = 4 pole plug M18x1, Binder Series *(connector not included)*
5 = DIN 43650/ISO 4400 plug, 3 pole + ground *(incudes ZBE 01)*
6 = M12x1 plug, 4 pole *(connector not included)*

Output Signal
A = 4-20mA, 2-wire

Pressure Range
HDA 478X psi version
0150, 0750, 1000, 1500, 3000, 5000, 6000, 9000

Approval
A = ATEX *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

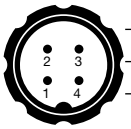
Types of Protection and Application Areas *(see chart below)*
1 = I M1 EEx ia
II 1G EEx ia IIC T6
II 1/2 G EEx ia IIC T6
II 2G EEx ia IIC T6
7 = II 3G EEx nL IIC T4
Other protection types upon request

Modification Number
000 = Standard

(psi)
psi version *(leave blank for bar version)*

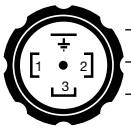
Pin Connections

Binder 714 M18



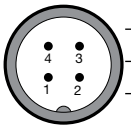
Pin	47X4-A
1	nc
2	Signal +
3	Signal -
4	nc

DIN 43650



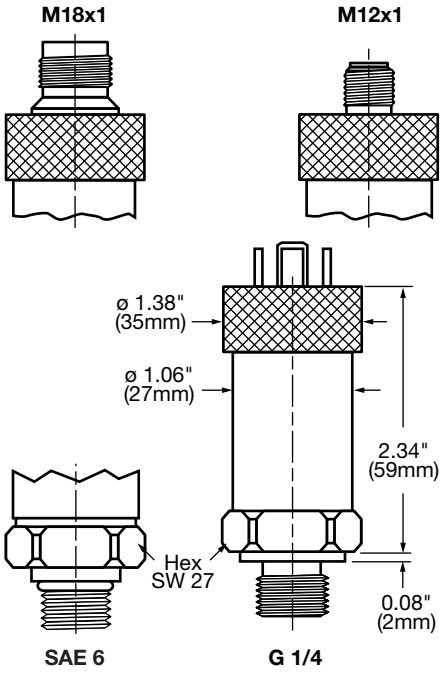
Pin	47X5-A
1	Signal +
2	Signal -
3	nc
4	PE

M12x1, 4 pole



Pin	47X6-A
1	Signal +
2	nc
3	Signal -
4	nc

Dimensions



Application Areas

Code Type Code	1	1	1	7
Protection class	I M1 EEx ia	II 1G EEx ia IIC T6 II 1/2G EEx ia IIC T6	II 2G EEx ia IIC T6	II 3G EEx nL IIC T4
Certificate number	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1016X	KEMA 05ATEX1021
Zones / Categories	Group I Category M 1 mining Protection type: intrinsically safe ia with barrier T_a: -25° to 60°C	Group II Category 1G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 0 Retrofit in Zone 0 T_a: -25° to 60°C	Group II Category 2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 1 & 2 T_a: -25° to 60°C	Group II Category 3G Gases Protection type: nL Use in: Zone 2 T_a: -25° to 60°C
Electrical Connection *(see model code)*	4, 5, 6	4, 5, 6	4, 5, 6	4, 5, 6

EDS 4100 Programmable Series

Absolute Pressure Switch
Intrinsically Safe with ATEX Approval

Applications

Description

The programmable pressure switch EDS 4100 in ATEX version, has been specially developed for use in potentially explosive atmospheres, and is based on the EDS 4000 series.

The switching point and reset point, the function of the switching outputs as N/C or N/O and the switching delay are user programmable with the HYDAC Programming Unit HPG 3000.

As with the industry model, the programmable EDS 4100 in ATEX version has a ceramic measurement cell with thick-film strain gauge for measuring absolute pressure in the low pressure range.

Special Features

- Switching point and switch-back point user-programmable
- Accuracy ≤ ±0.5% BFSL
- Certificates:
  DEKRA EXAM BVS 07 ATEX E 041 X
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals

ATEX Approvals

I M1 Ex ia I

II 1G Ex ia IIC T4, T5, T6
II 1/2G Ex ia IIC T4, T5, T6
II 2G Ex ia IIC T4, T5, T6

II 1D Ex iaD 20 T00°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Technical Details

Sensor Specifications		
Measuring ranges - psi	15, 50	
Overload pressure - psi	40, 150	
Burst pressure - psi	70, 250	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)* other connections upon request	
Tightening torque	G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40 Nm)	
Parts in contact with media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 150 g	
Switching Specifications		
Type	1 x PNP transistor output	
Repeatability	≤ ±0.1% FS max.	
Switching current	Max. 34 mA	
Set point / reset point / NO / NC	Programmed using HPG 3000 Programming Unit	
Switch on/off delay	8 to 2000 ms programmed using HPG 3000	
Switching cycles	≥ 100 million	
Environmental Condition		
Compensated temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Operating temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Ambient temperature	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Storage temperature range	-40° to 212°F	
Media temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
CE mark	EN 61000-6-1 / 2 / 3 / 4, EN 60079-0 / 11 / 26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental Protection	IP 67 *(M12x1, when an IP 67 connector is used)*	
Electrical Specifications		
Supply voltage	14 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
	I M1 / II 1G, 1/2G, 2G	**II 1D**
Max input current	100 mA	93 mA
Max input	0.7 W	0.65 W
Max capacitance of transmitter	33 nF	33 nF
Max inductance of transmitter	0 H	0 H
Isolation Voltage	125 VAC to housing *(standard)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Model Code

EDS 4 1 X 8 - XXXX - X - A X X - 000 - X1 (PSI)

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar ranges only)*
8 = 1/4"-18 NPT *(psi ranges only)*
Other connections upon request

Electrical Connection
8 = M12x1 plug, 5 pole *(connector not included)*

Pressure Range
For EDS 4186 *(1/4"-18 NPT only)*
0015, 0050 psi

Switching Output
P = Programmable

Approval
A = ATEX *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

Types of Protection and Application Areas
1 = I M1 Ex ia I
2 = II 1G Ex ia IIC T4, T5, T6
3 = II 1/2 G Ex ia IIC T4, T5, T6 / II 2G Ex ia IIC T4, T5, T6
8 = II 1D Ex iaD 20 T100°C

Modification Number
000 = Standard

Seal Material
F1 = FPM Seal *(hydraulic oil)*
E1 = EPDM Seal *(coolant, ammonia, water)*

(psi)
psi version *(Leave blank for bar version)*

Adjustment Ranges

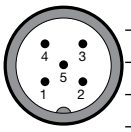
Set point in psi	5% to 100% of measuring ranges
Hysteresis in psi	1% to 96% of measuring ranges

Application Areas

Code Type Code	1	2	3	8
Protection class	I M1 Ex ia I	II 1G Ex ia IIC T4, T5, T6	II 2G Ex ia IIC II 1/2G Ex ia IIC T4, T5, T6	II 1D Ex iaD 20 T100 °C
Certificate number	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X
Zones / Categories	Group I Category M1 Mining Protection type: intrinsically safe ia with barrier	Group II Category 1G Gases Protection type: intrinsically safe ia with barrier Use in Zone 0 T4, T5: T_a = 70°C T6: T_a = 60°C	Group II Category 2G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in Zone 1, 2 Retrofit in Zone 0 T4, T5: T_a = 70°C T6: T_a = 60°C	Group II Category iD Dusts Protection type: intrinsically safe ia with barrier Use in Zone 20, 21, 22 Retrofit in Zone 20 T100: T_a = 85°C
Electrical Connection *(see model code)*	8	8	8	8

Pin Connections

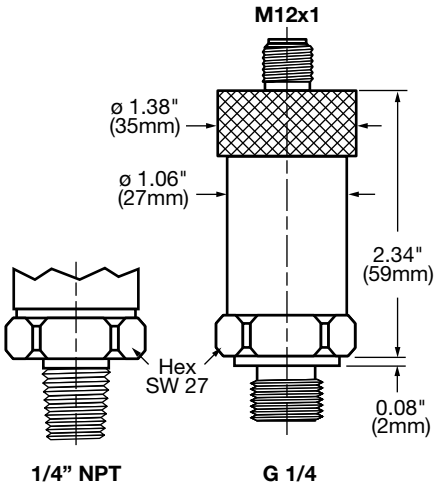
M12x1, 5 pole



Pin	Process Connection	HPG Connection
1	$+U_B$	$+U_B$
2	0 V	COM port 1
3	0 V	0 V
4	Out 1	nc
5	0 V	COM port 2

In process a 4 pole mating connector (e.g. ZBE 06) has to be used.

Dimensions



HPG 3000 Programming Unit

Manual available online
Part #00909422

ZBE 30-02

Part #06040851

HPG 3000 Power Supply with Connector

Part #02091103

EDS 4300 Programmable Series

Low Pressure Transducer
Intrinsically Safe with ATEX Approval

Applications

Description

The programmable electronic pressure switch EDS 4300 in ATEX version, has been specially developed for use in potentially explosive atmospheres, and is based on the EDS 4000 series.

The switching point and reset point, the function of the switching outputs as N/C or N/O and the switching delay are user programmable with the HYDAC Programming Unit HPG 3000.

As with the industry model, the programmable EDS 4300 in ATEX version has a ceramic measurement cell with thick-film strain gauge for measuring relative pressure in the low pressure range.

Special Features

- Switching point and switch-back point user-programmable
- Accuracy ≤ ±0.5% BFSL
- Certificates:
  DEKRA EXAM BVS 07 ATEX E 041 X
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals

ATEX Approvals

I M1 Ex ia I

II 1G Ex ia IIC T4, T5, T6
II 1/2G Ex ia IIC T4, T5, T6
II 2G Ex ia IIC T4, T5, T6

II 1D Ex iaD 20 T00°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Technical Details

Sensor Specifications		
Measuring ranges - psi	15, 50, 100, 150, 250, 500	
Overload pressure - psi	45, 150, 290, 450, 725, 1500	
Burst pressure - psi	70, 250, 400, 650, 1000, 2500	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)* other connections upon request	
Tightening torque	G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40 Nm)	
Parts in contact with media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 150 g	
Switching Specifications		
Type	1 x PNP transistor output	
Repeatability	≤ ±0.1% FS max.	
Switching current	Max. 34 mA	
Set point / reset point / NO / NC	Programmed using HPG 3000 Programming Unit	
Switch on/off delay	8 to 2000 ms programmed using HPG 3000	
Switching cycles	≥ 100 million	
Environmental Condition		
Compensated temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Operating temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Ambient temperature	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Storage temperature range	-40° to 212°F	
Media temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
CE mark	EN 61000-6-1 / 2 / 3 / 4, EN 60079-0 / 11 / 26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 67 *(M12x1, when an IP 67 connector is used)*	
Electrical Specifications		
Supply voltage	14 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
	I M1 / II 1G, 1/2G, 2G	**II 1D**
Max input current	100 mA	93 mA
Max input	0.7 W	0.65 W
Max capacitance of transmitter	33 nF	33 nF
Max inductance of transmitter	0 H	0 H
Isolation voltage	125 VAC to housing *(standard)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Model Code

EDS 4 3 X 8 - XXXX - X - A X X - 000 - X1 (PSI)

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar ranges only)*
8 = 1/4"-18 NPT *(psi ranges only)*
Other connections upon request

Electrical Connection
8 = M12x1 plug, 5 pole *(connector not included)*

Pressure Range
EDS 438X *(1/4"-18 NPT only)*
0015, 0050, 0100 0150, 0250, 0500 psi

Switching Output
P = Programmable

Approval
A = ATEX *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

Types of Protection and Application Areas
1 = I M1 Ex ia I
2 = II 1G Ex ia IIC T4, T5, T6
3 = II 1/2 G Ex ia IIC T4, T5, T6 / II 2G Ex ia IIC T4, T5, T6
8 = II 1D Ex iaD 20 T100°C

Modification Number
000 = Standard

Seal Material
F1 = FPM Seal *(hydraulic oil)*
E1 = EPDM Seal *(coolant, ammonia, water)*

(psi)
psi version *(Leave blank for bar version)*

Adjustment Ranges

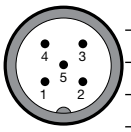
Set point in psi	5% to 100% of measuring ranges
Hysteresis in psi	1% to 96% of measuring ranges

Application Areas

Code Type Code	1	2	3	8
Protection class	I M1 Ex ia I	II 1G Ex ia IIC T4, T5, T6	II 2G Ex ia IIC II 1/2G Ex ia IIC T4, T5, T6	II 1D Ex iaD 20 T100 °C
Certificate number	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X
Zones / Categories	Group I Category M1 Mining Protection type: intrinsically safe ia with barrier	Group II Category 1G Gases Protection type: intrinsically safe ia with barrier Use in Zone 0 T4, T5: T_a = 70°C T6: T_a = 60°C	Group II Category 2G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in Zone 1, 2 Retrofit in Zone 0 T4, T5: T_a = 70°C T6: T_a = 60°C	Group II Category iD Dusts Protection type: intrinsically safe ia with barrier Use in Zone 20, 21, 22 Retrofit in Zone 20 T100: T_a = 85°C
Electrical Connection *(see model code)*	8	8	8	8

Pin Connections

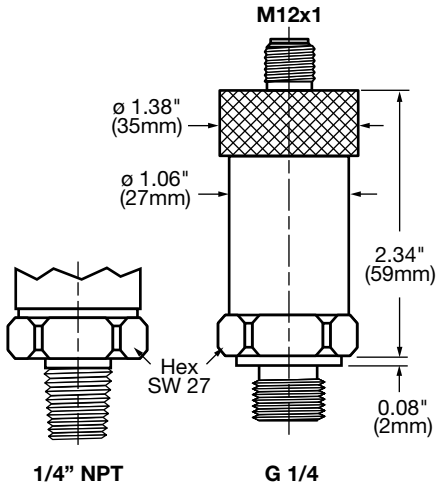
M12x1, 5 pole



Pin	Process Connection	HPG Connection
1	$+U_B$	$+U_B$
2	0 V	COM port 1
3	0 V	0 V
4	Out 1	nc
5	0 V	COM port 2

In process a 4 pole mating connector (e.g. ZBE 06) has to be used.

Dimensions



HPG 3000 Programming Unit

Manual available online
Part #00909422

ZBE 30-02

Part #06040851

HPG 3000 Power Supply with Connector

Part #02091103

EDS 4400 Programmable Series

High Pressure Transducer with Medium Accuracy
Intrinsically Safe with ATEX Approval

Applications

Description

The programmable electronic pressure switch EDS 4400 in ATEX version, has been specially developed for use in potentially explosive atmospheres, and is based on the EDS 4000 series.

The switching point and reset point, the function of the switching outputs as N/C or N/O and the switching delay are user programmable with the HYDAC Programming Unit HPG 3000.

As with the industry model, the programmable EDS 4400 in ATEX version has a stainless steel measurement cell with thin-film strain gauge for measuring relative pressure in the high pressure range.

Special Features

- Switching point and switch-back point user-programmable
- Accuracy ≤ ±0.5% BFSL
- Certificates:
  DEKRA EXAM BVS 07 ATEX E 041 X
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

ATEX Approvals

I M1 Ex ia I

II 1G Ex ia IIC T4, T5, T6
II 1/2G Ex ia IIC T4, T5, T6
II 2G Ex ia IIC T4, T5, T6

II 1D Ex iaD 20 T00°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Technical Details

Sensor Specifications		
Measuring ranges - psi	1000, 3000, 6000, 9000	
Overload pressure - psi	2900, 7250, 11600, 14500	
Burst pressure - psi	7250, 14500, 29000, 29000	
Adjustment pressure range - psi	Min 50, 75, 150, 300, 450 Max 980, 1470, 2940, 5880, 8820	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* SAE 6 9/16-18 UNF 2A *(psi ranges only)* other connections upon request	
Tightening torque	15 lb-ft (20 Nm)	
Parts in contact with media	Sensor: Stainless steel 1.4542 Mechanical connection: Stainless steel 1.4542, 1.4301, 1.4435, 1.4571, 1.4404, 316L, 304 Seal: FPM (SAE 6, G1/4)	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 150 g	
Switching Specifications		
Type	1 x PNP transistor output	
Repeatability	≤ ±0.1% FS max.	
Switching current	Max. 34 mA	
Set point / reset point / NO / NC	Programmed using HPG 3000 Programming Unit	
Switch on/off delay	8 to 2000 ms programmed using HPG 3000	
Switching cycles	≥ 100 million	
Environmental Condition		
Compensated temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Operating temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Ambient temperature	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
Storage temperature range	-40° to 212°F	
Media temperature range	T6: -4° to 140°F T4/T5: -4° to 158°F	T100: -4° to 185°F
CE mark	EN 61000-6-1 / 2 / 3 / 4, EN 60079-0 / 11 / 26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental Protection	IP 67 *(M12x1, when an IP 67 connector is used)*	
Electrical Specifications		
Supply voltage	14 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
	I M1 / II 1G, 1/2G, 2G	**II 1D**
Max input current	100 mA	93 mA
Max input	0.7 W	0.65 W
Max capacitance of transmitter	33 nF	33 nF
Max inductance of transmitter	0 H	0 H
Isolation voltage	125 VAC to housing *(standard)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Model Code

EDS 4 4 X 8 - XXXX - X - A X X - 000 (PSI)

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar ranges only)*
7 = SAE 6 9/16-18 UNF2A *(psi ranges only)*
Other connections upon request

Electrical Connection
8 = M12x1 plug, 5 pole *(connector not included)*

Pressure Range
For EDS 447X *(SAE 6 9/16-20 only)*
1000, 3000, 6000, 9000 psi

Switching Output
P = Programmable

Approval
A = ATEX *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

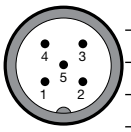
Types of Protection and Application Areas
1 = I M1 Ex ia I
2 = II 1G Ex ia IIC T4, T5, T6
3 = II 1/2 G Ex ia IIC T4, T5, T6 / II 2G Ex ia IIC T4, T5, T6
8 = II 1D Ex iaD 20 T100°C

Modification Number
000 = Standard

(psi)
psi version *(Leave blank for bar version)*

Pin Connections

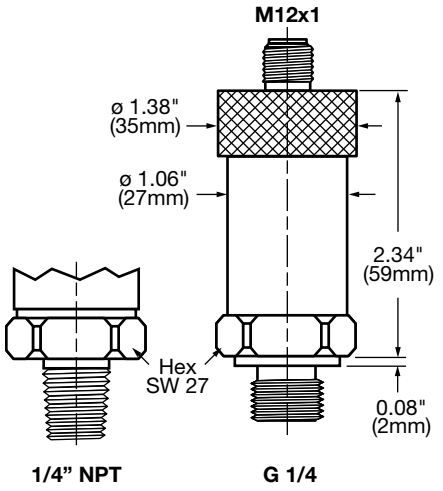
M12x1, 5 pole



Pin	Process Connection	HPG Connection
1	$+U_B$	$+U_B$
2	0 V	COM port 1
3	0 V	0 V
4	Out 1	nc
5	0 V	COM port 2

In process a 4 pole mating connector (e.g. ZBE 06) has to be used.

Dimensions



Adjustment Ranges

Set point in psi	5% to 100% of measuring ranges
Hysteresis in psi	1% to 96% of measuring ranges

Application Areas

Code Type Code	1	2	3	8
Protection class	I M1 Ex ia I	II 1G Ex ia IIC T4, T5, T6	II 2G Ex ia IIC II 1/2G Ex ia IIC T4, T5, T6	II 1D Ex iaD 20 T100 °C
Certificate number	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X
Zones / Categories	Group I Category M1 Mining Protection type: intrinsically safe ia with barrier	Group II Category 1G Gases Protection type: intrinsically safe ia with barrier Use in Zone 0 T4, T5: T_a = 70°C T6: T_a = 60°C	Group II Category 2G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in Zone 1, 2 Retrofit in Zone 0 T4, T5: T_a = 70°C T6: T_a = 60°C	Group II Category iD Dusts Protection type: intrinsically safe ia with barrier Use in Zone 20, 21, 22 Retrofit in Zone 20 T100: T_a = 85°C
Electrical Connection *(see model code)*	8	8	8	8

HPG 3000 Programming Unit

Manual available online
Part #00909422

ZBE 30-02

Part #06040851

HPG 3000 Power Supply with Connector

Part #02091103

HDA 4100 Series
Absolute Pressure Transducer
Intrinsically Safe with CSA Approval

Applications

Description

The pressure transmitter HDA 4100 in CSA version has been specially developed for the North American market for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4100 in CSA version has a ceramic measurement cell with thick film strain gauge for measuring absolute pressure in the low pressure range.

Intended areas of application are, for example, in the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Certificate: CSA 1760344
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals

Intrinsically Safe *(all connector versions)*:
Class I Division 1 Group A, B, C, D T6 [C, US]
Class I Zone 0 AEx ia IIC T6 [US]
Ex ia IIC T6 [C]

Intrinsically safe *(connectors: 9, A only)*:
Class I, II, III Division 1 Group A, B, C, D, E, F, G T6 [C, US]

Non incendive *(all connector versions)*:
Class I Division 2 Group A, B, C, D, T4A [C, US]
Class I Zone 2 AEx nL IIC T4 [US]
Class I Zone 2 Ex nL IIC T4 [C]

Non incendive *(connectors: 9 only)*:
Class I, II, III Division 2 Group A, B C, D, F, T4A [C, US]
Class I Zone 2 AEx nA II T4 [US]
Class I Zone 2 Ex nA II T4 [C]

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

CSA mark is for products sold both in the U.S.A. and Canada

Technical Details

Sensor Specifications	
Measuring ranges	15, 50
Overload pressure	40, 150
Burst pressure	70, 250
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)*
Tightening torque	G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40 Nm)
Parts in contact with media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ± 0.5% BFSL.
Temperature compensation zero point	≤ ±0.012% / °F typ. ≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.012% / °F typ. ≤ ±0.017% / °F max.
Rise time	≤ 2 ms
Long-term drift	≤ ± 0.3% FS typ. / year
Life expectancy	10 million load cycles (0 to 100% FS)
Weight	Approximately 180 g
Output signal	4 to 20 mA, 2 wire, R_{Lmax} = (UB - 10V) / 20 mA [kΩ]
Environmental Condition	
Type of protection: intrinsically safe	
Compensated temperature range	-4° to 140°F (-20° to 60°C)
Operating temperature range	-4° to 140°F (-20° to 60°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-4° to 140°F (-20° to 60°C)
Type of protection: enclosures against dust non-incendive	
Compensated temperature range	-4° to 185°F (-20° to 85°C)
Operating temperature range	-4° to 185°F (-20° to 85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-4° to 185°F (-20° to 85°C)
CSA mark	Certificat number: CSA 1760344
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g
Environmental protection	min. IP 65 / NEMA 4
Electrical Specifications	
Supply voltage	12 to 28 VDC
Residual ripple suppy voltage	≤ 5%
Max supply current	approximately 100 mA
Max supply power	up to 28V: 1 W
Max capacitance of transmitter	≤ 12 nF
Max inductance of transmitter	0 H
Isolation voltage	125 VAC to housing *(standard)*
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

Model Code

HDA 4 1 X X - A - XXXX - C X X - XXX - X1 (PSI) XX in

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar ranges only)*
8 = 1/4"-18 NPT *(psi ranges only)*

Electrical Connection
9 = Conduit connection 1/2"-14 NPT male, 48" flying leads
A = DIN 43650/ISO 4400 plug, 3 pole + PE, 1/2" Conduit female
5 = DIN 43650/ISO 4400 plug, 3 pole + ground *(incudes ZBE 01)*
6 = M12x1 plug, 4 pole *(connector not included)*

Output Signal
A = 4-20mA, 2-wire

Pressure Range
for HDA 418x *(1/4"-18 NPT only)*
0015, 0050 psi

Approval
C = CSA *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

Types of protection and application areas *(see chart below)*
A = Group 1
B = Groups 2 and 3
C = Group 4

Modification Number
000= Standard
(other number used e.g. for: version with long housing, snubber, pin wiring, connector on flying leads)

Seal Material
F1 = FPM Seal *(hydraulic oil)*
E1 = EPDM Seal *(coolant, ammonia, water)*

(psi)
psi version *(Leave blank for bar version)*

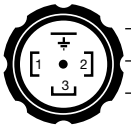
Cable Length
XX = 48" standard *(type 9 electrical connection only)*

Application Areas

Code Type Code	1	2	3	4
Protection class	Intrinsically safe Use in gases and dust	Intrinsically safe Use in gases	Non incendive with field wiring Use in gases	Non incendive Use in gases and dust
Certificate number	1760344			
Zones / Categories	Intrinsically safe Class I, II, III Division 1 Group A, B, C, D, E, F, G T6	Intrinsically safe Ex ia IIC T6 Class I Zone 0 AEx ia IIC T6 Class I Division 1 Group A, B, C, D T6	Non incendive Class I Division 2 Group A, B, C, D, T4A Class I Zone 2 AEx nL IIC T4 Class I Zone 2 Ex nL IIC T4	Non incendive Class I, II, III Division 2 Group A, B, C, D, F, G, T4A Class I Zone 2 Ex nA II T4 Class I Zone 2 AEx nA II T4
Electrical Connection *(see model code)*	9; A	5; 6; 9; A		9
Model code - characteristic	A	B		C

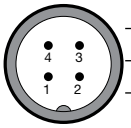
Pin Connections

DIN 43650



Pin	41X5-A	41XA-A
1	Signal +	Signal +
2	Signal -	Signal -
3	nc	nc
4	PE	PE

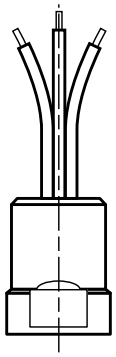
M12x1, 4 pole

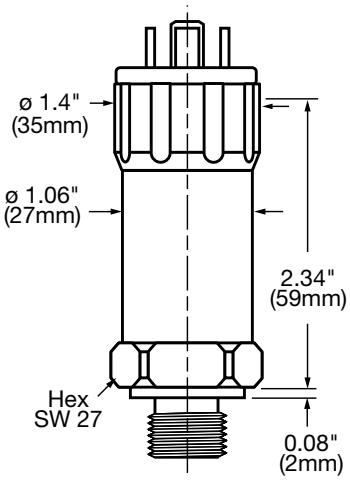


Pin	41x6-A
1	Signal +
2	nc
3	Signal -
4	nc

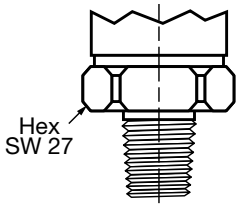
Dimensions

Conduit Connection Flying Leads





G 1/4



1/4" NPT

HDA 4300 Series

Low Pressure Transducer
Intrinsically Safe with CSA Approval

Applications

Description

The pressure transmitter HDA 4300 in CSA version has been specially developed for the North American market for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4300 in CSA version has a ceramic measurement cell with thick film strain gauge for measuring absolute pressure in the low pressure range.

Intended areas of application are, for example, in the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Certificate: CSA 1760344
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals

Intrinsically Safe *(all connector versions)*:
Class I Division 1 Group A, B, C, D T6 [C, US]
Class I Zone 0 AEx ia IIC T6 [US]
Ex ia IIC T6 [C]

Intrinsically safe *(connectors: 9, A only)*:
Class I, II, III Division 1 Group A, B, C, D, E, F, G T6 [C, US]

Non incendive *(all connector versions)*:
Class I Division 2 Group A, B, C, D, T4A [C, US]
Class I Zone 2 AEx nL IIC T4 [US]
Class I Zone 2 Ex nL IIC T4 [C]

Non incendive *(connectors: 9 only)*:
Class I, II, III Division 2 Group A, B C, D, F, T4A [C, US]
Class I Zone 2 AEx nA II T4 [US]
Class I Zone 2 Ex nA II T4 [C]

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

CSA mark is for products sold both in the U.S.A. and Canada

Technical Details

Sensor Specifications	
Measuring Ranges - psi	15, 30, 50, 100, 150, 250, 500
Overload Pressure - psi	45, 100, 150, 290, 450, 725, 1500
Burst Pressure - psi	70, 150, 250, 400, 650, 1000, 2500
Mechanical Connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)*
Tightening Torque	G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40 Nm)
Parts in Contact with Media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ± 0.5% BFSL.
Temperature compensation zero point	≤ ±0.012% / °F typ. ≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.012% / °F typ. ≤ ±0.017% / °F max.
Rise time	≤ 2 ms
Long-term drift	≤ ± 0.3% FS typ. / year
Life Expectancy	10 million load cycles (0 to 100% FS)
Weight	Approximately 180 g
Output Signal	4 to 20 mA, 2 wire, R_{Lmax} = (UB - 10V) / 20 mA [kΩ]
Environmental Condition	
Type of protection: intrinsically safe	
Compensated temperature range	-4° to 140°F (-20° to 60°C)
Operating temperature range	-4° to 140°F (-20° to 60°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-4° to 140°F (-20° to 60°C)
Type of protection: enclosures against dust non-incendive	
Compensated temperature range	-4° to 185°F (-20° to 85°C)
Operating temperature range	-4° to 185°F (-20° to 85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-4° to 185°F (-20° to 85°C)
CSA mark	Certificat Number: CSA 1760344
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g
Environmental Protection	min. IP 65 / NEMA 4
Electrical Specifications	
Supply voltage	12 to 28 VDC
Residual ripple suppy voltage	≤ 5%
Max supply current	approximately 100 mA
Max supply power	up to 28V: 1 W
Max capacitance of transmitter	≤ 12 nF
Max inductance of transmitter	0 H
Isolation Voltage	125 VAC to housing *(standard)*
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

Model Code

HDA 4 3 X X - A - XXXX - C X X - XXX - X1 (PSI) XX in

Mechanical Connection
4 =G1/4A DIN 3852 male
(bar ranges only)
8 =1/4"-18 NPT
(psi ranges only)

Electrical Connection
9 =Conduit connection 1/2"-14 NPT male, 48" flying leads
A =DIN 43650/ISO 4400 plug, 3 pole + PE, 1/2" Conduit female
5 =DIN 43650/ISO 4400 plug, 3 pole + ground *(incudes ZBE 01)*
6 =M12x1 plug, 4 pole
(connector not included)

Output Signal
A =4-20mA, 2-wire

Pressure Range
for HDA 438x *(1/4"-18 NPT only)*
0015, 0030, 0050, 0100, 0150, 0250, 0500 psi

Approval
C =CSA *(for details see description of approvals)*

Isolation Voltage
N =125 VAC to housing *(standard)*

Types of protection and application areas *(see chart below)*
A =Group 1
B =Group 2 and 3
C =Group 4

Modification Number
000=Standard
(other number used e.g. for: version with long housing, snubber, pin wiring, connector on flying leads)

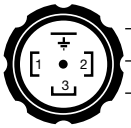
Seal Material
F1 =FPM Seal *(hydraulic oil)*
E1 =EPDM Seal *(coolant, ammonia, water)*

(psi)
psi version *(Leave blank for bar version)*

Cable Length
XX =48" standard *(type 9 electrical connection only)*

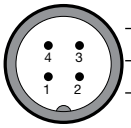
Pin Connections

DIN 43650



Pin	43X5-A	43XA-A
1	Signal +	Signal +
2	Signal -	Signal -
3	nc	nc
4	PE	PE

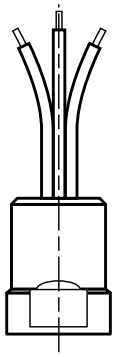
M12x1, 4 pole

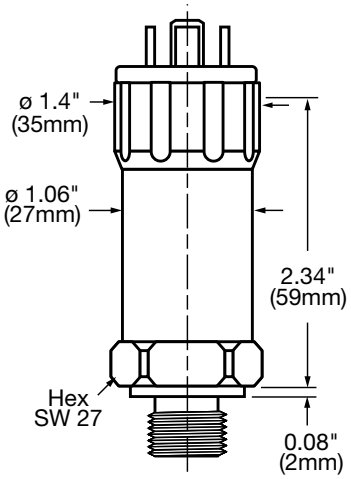


Pin	43x6-A
1	Signal +
2	nc
3	Signal -
4	nc

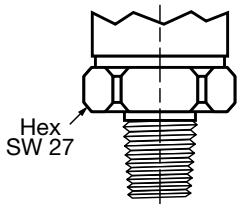
Dimensions

Conduit Connection Flying Leads





G 1/4



1/4" NPT

Application Areas

Code Type Code	1	2	3	4
Protection class	Intrinsically safe Use in gases and dust	Intrinsically safe Use in gases	Non incendive with field wiring Use in gases	Non incendive Use in gases and dust
Certificate number	1760344			
Zones / Categories	Intrinsically safe Class I, II, III Division 1 Group A, B, C, D, E, F, G T6	Intrinsically safe Ex ia IIC T6 Class I Zone 0 AEx ia IIC T6 Class I Division 1 Group A, B, C, D T6	Non incendive Class I Division 2 Group A, B, C, D, T4A Class I Zone 2 AEx nL IIC T4 Class I Zone 2 Ex nL IIC T4	Non incendive Class I, II, III Division 2 Group A, B, C, D, F, G, T4A Class I Zone 2 Ex nA II T4 Class I Zone 2 AEx nA II T4
Electrical Connection *(see model code)*	9; A	4; 5; 6; 9; A		9
Model code - characteristic	A	B		C

HDA 4700 Series
High Pressure Transducer
Intrinsically Safe with CSA Approval

Applications

Description

The pressure transmitter HDA 4700 in CSA version has been specially developed for the North American market for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4700 in CSA version has a ceramic measurement cell with thick film strain gauge for measuring absolute pressure in the low pressure range.

Intended areas of application are, for example, in the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Certificate: CSA 1760344
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals

Intrinsically Safe *(all connector versions)*:
Class I Division 1 Group A, B, C, D T6 [C, US]
Class I Zone 0 AEx ia IIC T6 [US]
Ex ia IIC T6 [C]

Intrinsically safe *(connectors: 9, A only)*:
Class I, II, III Division 1 Group A, B, C, D, E, F, T6 [C, US]

Non incendive *(all connector versions)*:
Class I Division 2 Group A, B, C, D, T4A [C, US]
Class I Zone 2 AEx nL IIC T4 [US]
Class I Zone 2 Ex nL IIC T4 [C]

Non incendive *(connectors: 9 only)*:
Class I, II, III Division 2 Group A, B C, D, F, T4A [C, US]
Class I Zone 2 AEx nA II T4 [US]
Class I Zone 2 Ex nA II T4 [C]

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

CSA mark is for products sold both in the U.S.A. and Canada

Technical Details,

Sensor Specifications	
Measuring ranges - psi	150, 500, 750, 1000, 1500, 3000, 6000, 9000
Overload pressure - psi	290, 1160, 1160, 2900, 2900, 7250, 11600, 14500
Burst pressure - psi	1450, 2900, 2900, 7250, 7250, 14500, 29000, 29000
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* SAE 6 9/16-18 UNF2A *(psi ranges only)* 1/4"-18 NPT *(psi ranges only)*
Tightening torque	SAE 6, G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40 Nm)
Parts in contact with media	Sensor: Stainless steel 1.4542 Mechanical connection: Stainless steel 1.4542, 1.4301, 1.4435, 1.4571, 1.4404, 316L, 304 Seal: FPM (SAE 6, G1/4)
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.25% BFSL.
Temperature compensation zero point	≤ ±0.0045% / °F typ. ≤ ±0.0085% / °F typ.
Temperature compensation over range	≤ ±0.0045% / °F typ. ≤ ±0.0085% / °F typ.
Rise time	≤ 2 ms
Long-term drift	≤ ±0.1% FS typ. / year
Life expectancy	10 million load cycles (0 to 100% FS)
Weight	Approximately 180 g
Output signal	4 to 20 mA, 2 wire, $R_{L\,max}$ = (UB - 10V) / 20 mA [kΩ]
Environmental Condition	
Type of protection: intrinsically safe	
Compensated temperature range	-4° to 140°F (-20° to 60°C)
Operating temperature range	-4° to 140°F (-20° to 60°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-4° to 140°F (-20° to 60°C)
Type of protection: enclosures against dust non-incendive	
Compensated temperature range	-4° to 185°F (-20° to 85°C)
Operating temperature range	-4° to 185°F (-20° to 85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-4° to 185°F (-20° to 85°C)
CSA mark	Certificate number: CSA 1760344
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g
Environmental protection	min. IP 65 / NEMA 4
Electrical Specifications	
Supply voltage	12 to 28 VDC
Residual ripple suppy voltage	≤ 5%
Max supply current, 3-wire	approximately 100 mA
Max supply power	up to 28V: 1 W
Max capacitance of transmitter	≤ 12 nF
Max inductance of transmitter	0 H
Isolation voltage	125 VAC to housing *(standard)*
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

Model Code

HDA 4 7 - X - X - A - XXXX - C N X - XXX (PSI) XX in

Mechanical Connection
4 = G1/4A DIN 3852 male *(bar ranges only)*
7 = SAE 6 9/16-18 UNF2A *(psi ranges only)*
8 = 1/4"-18 NPT *(psi ranges only)*

Electrical Connection
9 = Conduit connection 1/2"-14 NPT male, 48" flying leads
A = DIN 43650/ISO 4400 plug, 3 pole + PE, 1/2" Conduit female
5 = DIN 43650/ISO 4400 plug, 3 pole + ground *(incudes ZBE 01)*
6 = M12x1 plug, 4 pole *(connector not included)*

Output Signal
A = 4-20mA, 2-wire

Pressure Range
for HDA 478x only *(1/4"-18 NPT)*
0150, 0500, 0750, 1000, 1500, 3000, 6000, 9000 psi

Approval
C = CSA *(for details see description of approvals)*

Isolation Voltage
N = 125 VAC to housing *(standard)*

Types of protection and application areas *(see chart below)*
A = Group 1
B = Group 2 and 3
C = Group 4

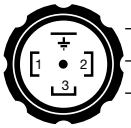
Modification Number
000 = Standard
(other number used e.g. for: version with long housing, snubber, pin wiring, connector on flying leads)

(psi)
psi version *(Leave blank for bar version)*

Cable Length
XX = 48" standard *(type 9 electrical connection only)*

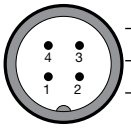
Pin Connections

DIN 43650



Pin	47X5-A	47XA-A
1	Signal +	Signal +
2	Signal -	Signal -
3	nc	nc
4	PE	PE

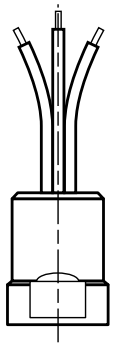
M12x1, 4 pole

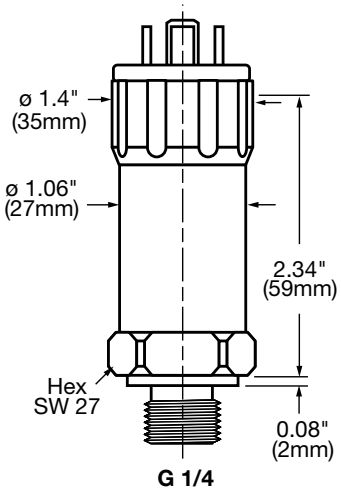


Pin	47x6-A
1	Signal +
2	nc
3	Signal -
4	nc

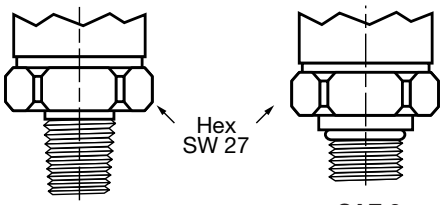
Dimensions

Conduit Connection Flying Leads





G 1/4



1/4" NPT **SAE 6**

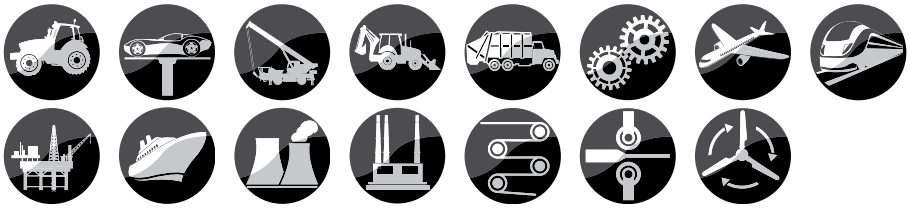
Application Areas

Code Type Code	1	2	3	4
Protection class	Intrinsically safe Use in gases and dust	Intrinsically safe Use in gases	Non incendive with field wiring Use in gases	Non incendive Use in gases and dust
Certificate number	1760344			
Zones / Categories	Intrinsically safe Class I, II, III Division 1 Group A, B, C, D, E, F, G T6	Intrinsically safe Ex ia IIC T6 Class I Zone 0 AEx ia IIC T6 Class I Division 1 Group A, B, C, D T6	Non incendive Class I Division 2 Group A, B, C, D, T4A Class I Zone 2 AEx nL IIC T4 Class I Zone 2 Ex nL IIC T4	Non incendive Class I, II, III Division 2 Group A, B, C, D, F, G, T4A Class I Zone 2 Ex nA II T4 Class I Zone 2 AEx nA II T4
Electrical Connection *(see model code)*	9; A	4; 5; 6; 9; A		9
Model code - characteristic	A	B		C

HDA 4700 Series

High Pressure Transducer CSA Explosion Proof, ATEX & IECEx Explosion & Flame Proof

Applications



Description

The HDA 4700 series electronic pressure transmitter with triple approval *($_{c}$CSA$_{us}$, ATEX Exd, IECExd)* allows installtion world wide in any hazardous environment. This also optimizes spare part stock and prevents technicians to apply the wrong transmitters to their systems.

The transmitter is using our highly reliable and proven thin film pressure sensor which is welded to the connection so no internal seal is required. All welded parts as well as the housing is made out of industrial standard stainless steels toprevent corrosion. The triple approval is also available with NACE compliant materials.

The main areas of applications for this transmitter are oil and gas *(BOP's, top drives, turn tables, control panels)* and mining *(underground vehicles, hydraulic drives)* as well as other hazardous areas.

Special Features

- Accuracy ≤ ±0.25% BFSL
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals & Areas of Usage

$_{c}$CSA$_{US}$ Explosion Proof *(Seal Not Required)*
Class I Group A, B, C, D
Class II Group E, F, G
Class III
Type 4

ATEX Flame Proof
I M2 Ex d I
II 2G Ex d IIC T6, T5

IECEx Flame Proof
Ex d I Mb
Ex d IIC T6, T5 Gb

Technical Details,

Sensor Specifications	
Measuring ranges - psi	100, 300, 500, 1000, 1500, 3000, 5000, 6000, 9000, 10000, 15000
Overload pressure - psi	290, 1160, 1160, 2900, 2900, 7250, 11600, 11600, 14500, 14500, 23200
Burst pressure - psi	1450, 2900, 2900, 7250, 7250, 14500, 29000, 29000, 29000, 29000, 43500
Mechanical connection	1/4"-18 NPT, male 1/4"-18 NPT, female SAE 6 9/16-UNF 2A G1/4A DIN 3852 *(bar ranges only)* SF 250 CX20, Autoclave (7/16-20 UNF 2B)
Tightening torque	SAE 6, G1/4: 15 lb-ft (20 Nm) SF 250, 1/4 NPT: 30 lb-ft (40 Nm)
Materials in contact with media	1.4542, 1.4301, 304, 630
Housing materials	1.4404, 1.4435, 316L
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.25% BFSL.
Temperature compensation zero point	≤ ±0.0045% / °F typ. ≤ ±0.0085% / °F max.
Temperature compensation over range	≤ ±0.0045% / °F typ. ≤ ±0.0085% / °F max.
Rise time	≤ 2 ms
Long-term drift	≤ ±0.1% FS typ. / year
Life expectancy	10 million load cycles (0 to 100% FS)
Weight	Approx. 300 g
Output signal	4 to 20 mA, 2 wire, $R_{Lmax} = (U_B - 8V) / 20$ mA [kΩ]
Environmental Condition	
Compensated temperature range	T5: -13° to 176°F (-25° to 80°C) T6: -13° to 140°F (-25° to 60°C)
Operating temperature range[1)]	T5: -40° to 176°F (-40° to 80°C) T6: -40° to 140°F (-40° to 60°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range[1)]	-40° to 212°F (-40° to 100°C) -4° to 212°F (-20° to 100°C) with FPM
CE mark	EN 61000-6-1 / 2 / 3 / 4, IEC 600079-0 / 1
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g
Environmental Protection	IP 65 *(vented gauge)* / IP 69K *(sealed gauge)*
Electrical Specifications	
Supply voltage	8 to 30V
Residual ripple suppy voltage	≤ 5%
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

1) With SAE or G1/4, in combination with FPM seal -4°F (-20°C)

Model Code

HDA 4 7 X X - X - XXXXX - D - X - 000 (PSI) 72 inch

Mechanical Connection
- 4 = G1/4A DIN 3852 male *(bar ranges only)*
- 7 = SAE 6 9/16-18 UNF2A *(psi ranges only)*
- 8 = 1/4-18 NPT, male
- F = 1/4-18 NPT, female *(upon request)*
- C = SF 250 CX20, Autoclave (7/16-20 UNF 2B) *Others on request*

Electrical Connection
- 9 = Conduit connection *(1/2-14 NPT male)* with flying leads
- G = Conduit connection *(1/2-14 NPT male)* with open ended cable

Signal
- A = 4 to 20 mA *(2-conductor)*

Measuring Ranges

for HDA 478x and 47Fx only *(1/4-18 NPT male & female)*
0100, 0300, 0500, 1000, 1500, 3000, 5000, 6000, 9000

for HDA 47Cx only *(SF 250 CX20, Autoclave)*
10000, 15000 psi

Approval
- D = CSA Explosion Proof - seal not required ATEX / IECEx Flame Proof

Gauge Type
- S = Sealed gauge *(ranges 500 psi and higher)*
- V = Vented seal *(ranges lower than 500 psi)*

Modification Number
- 000 = Standard

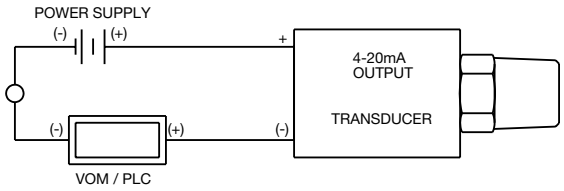
(psi)

psi version *(Leave blank for bar version)*

Cable length

72 inch standard
Other lengths upon request

Circuit Diagram

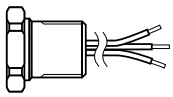


Application Areas

Protection class	$_{c}CSA_{US}$	Explosion Proof Seal Not Required	
	ATEX	Explosion and Flame Proof	
	IECEx	Explosion and Flame Proof	
Certificate number	ATEX KEMA 10ATEX0100 X CSA MC 224264 IECEx KEM 10.0053X		
Zones / Categories	$_{c}CSA_{US}$	Class I Class II Class III Type 4	Group A, B, C, D Group E, F, G
	ATEX	I M2 II 2G	Ex d I Ex d IIC T6, T5
	IECEx	Ex d I Mb Ex d IIC T6, T5 Gb	
Electrical Connection *(see model code)*	9; G		

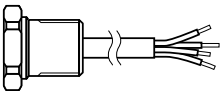
Pin Connections

Conduit



Wire	47x9-A
red	signal +
black	signal -
green/ yellow	PE/GND

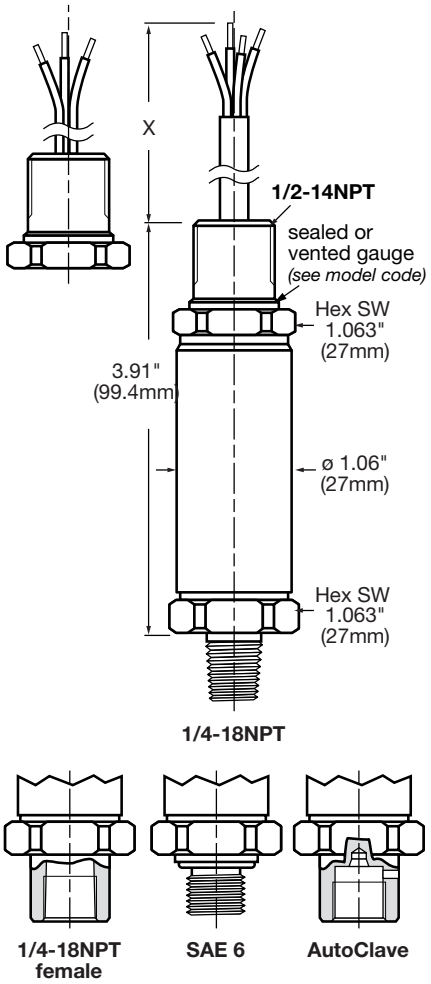
DIN 43650



Wire	47xG-A
white	signal -
brown	signal +
green	n.c.
yellow	n.c.

See Label and instruction manual for detail on wirings.

Dimensions



EDS 4000 Series

Programmable Pressure Switch CSA explosion Proof, ATEX & IECEx Explosion & Flame Proof

Applications

Description

The EDS 4000 series electronic pressure switch with triple approval *(cCSAus, ATEX Exd, IECExd)* allows installtion world wide in any hazardous environment. This also optimizes spare part stock and prevents technicians to apply the wrong pressure switch to their systems.

The switch is using our highly reliable and proven thin film pressure sensor which is welded to the connection so no internal seal is required. All welded parts as well as the housing is made out of industrial standard stainless steels toprevent corrosion. The triple approval is also available with NACE compliant materials.

The main areas of applications for this pressure switch are oil and gas *(BOP's, top drives, turn tables, control panels)* and mining *(underground vehicles, hydraulic drives)* as well as other hazardous areas.

Special Features

- Accuracy ≤ ±0.5 % BFSL
- Option of PNP or NPN switching outputs
- High switching output capacity
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals

cCSAus Explosion Proof *(Seal Not Required)*
Class I Group A, B, C, D
Class II Group E, F, G
Class III
Type 4

ATEX Flame Proof
I M2 Ex d I
II 2G Ex d IIC T6, T5

IECEx Flame Proof
Ex d I Mb
Ex d IIC T6, T5 Gb

Technical Details,

Sensor Specifications		
Measuring ranges - psi	100, 300, 500, 1000, 1500, 3000, 5000, 6000, 9000, 10000, 15000	
Overload pressure - psi	290, 1160, 1160, 2900, 2900, 7250, 11600, 11600, 14500, 14500, 23200	
Burst pressure - psi	1450, 2900, 2900, 7250, 7250, 14500, 29000, 29000, 29000, 29000, 43500	
Mechanical connection	1/4"-18 NPT, male 1/4"-18 NPT, female SAE 6 9/16-UNF 2A G1/4A DIN 3852 *(bar ranges only)* SF 250 CX20, Autoclave (7/16-20 UNF 2B)	
Tightening torque	SAE 6, G1/4: 15 lb-ft (20 Nm) SF 250, 1/4" NPT: 30 lb-ft (40 Nm)	
Material in contact with media	1.4542, 1.4301, 304, 630	
Housing material	1.4404, 1.4435, 316L	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 280 g	
Switching Specifications		
Type	1 or 2 PNP outputs *(NPN upon request)*	
Repeatability	≤ ±0.1% FS max.	
Switching current	1 Switching ouput 2 Switching outputs	1.2A 1.0A each
Set / reset point / NO /NC	Programmed using HPG 3000 Programming Unit	
Set point in psi[2]	5 to 100% of measuring range	
Hysteresis in psi	1 to 96% of measuring range	
Switch on/off delay	8 to 2000 ms programmed using HPG 3000	
Switching cycles	≥ 100 million	
Environmental Condition		
Compensated temperature range	T5: -13° to 176°F (-25° to 80°C) T6: -13° to 140°F (-25° to 60°C)	
Operating temperature range[1]	T5: -40° to 176°F (-25° to 80°C) T6: -40° to 140°F (-40° to 60°C)	
Storage temperature range	-40° to 212°F (-40° to 100°C)	
Media temperature range[1]	-40° to 212°F (-40° to 100°C) -4° to 212°F (-20° to 100°C) with FPM	
CE mark	EN 61000-6-1 / 2 / 3 / 4, IEC 600079-0 / 1	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental Protection	IP 65 *(vented gauge)* / IP 69K *(sealed gauge)*	
Electrical Specifications		
Supply voltage	12 to 30 VDC	
Residual ripple suppy voltage	≤ 5%	
Current consumption	approximately 25 mA *(inactive switching output)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

1) With SAE or G1/4, in combination with FPM seal -4°F (-20°C)
2) Max set point for 10,000 psi = 9980 psi

Model Code

EDS 4 4 X X - XXXX - X P - D X - 000 (PSI) 72 inch

Mechanical Connection
- 4 = G1/4A DIN 3852 male *(bar ranges only)*
- 7 = SAE 6 9/16-18 UNF2A
- 8 = 1/4-18 NPT, male
- F = 1/4-18 NPT, female *(upon request)*
- C = SF 250 CX20, Autoclave (7/16-20 UNF 2B) *Others on request*

Electrical Connection
- 9 = Conduit connection *(1/2-14 NPT male)* with flying leads
- G = Conduit connection *(1/2-14 NPT male)* with open ended cable

Measuring Ranges
0100, 0300, 0500, 1000, 1500, 3000, 6000, 9000

for EDS 44Cx only *(SF 250 CX20, Autoclave)*
10,000*, 15,000 psi

Output
- 1 = 1 Switching Output
- 2 = 2 Switching Outputs

Output Technology
- P = Programmable switching output

Approval
- D = CSA Explosion Proof - seal not required ATEX / IECEx Flame Proof

Gauge Type
- S = Sealed gauge *(ranges 500 psi and higher)*
- V = Vented seal *(ranges lower than 500 psi)*

Modification Number
- 000 = Standard

(psi)
psi version *(Leave blank for bar version)*

Cable length
72 inch = standard
Other lengths upon request

*9980 is the max setpoint

HPG 3000 Programming Unit
Manual available online
Part #00909422

The HPG 3000 is NOT allowed to be used in hazardous environments.

UVM 3000 Adapter Cable
Part# 00909752

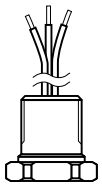
HPG 3000 Power Supply with Connector
Part #02091103

Application Areas

Protection class	$_{c}CSA_{US}$	Explosion Proof Seal Not Required	
	ATEX	Explosion and Flame Proof	
	IECEx	Explosion and Flame Proof	
Certificate number	ATEX KEMA 10ATEX0100 X CSA MC 224264 IECEx KEM 10.0053X		
Zones / Categories	$_{c}CSA_{US}$	Class I Class II Class III Type 4	Group A, B, C, D Group E, F, G
	ATEX	I M2 II 2G	Ex d I Ex d IIC T6, T5
	IECEx	Ex d I Mb Ex d IIC T6, T5 Gb	
Electrical Connection *(see model code)*	9; G		

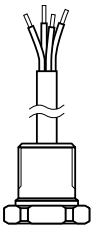
Pin Connections

Conduit Single Leads



Wire	44x9-X-1	44x9-X-2
red	signal +	signal +
white	switch ouput 1	switch ouput 1
black	0 V	0 V
green	program	program*
brown		switch ouput 2

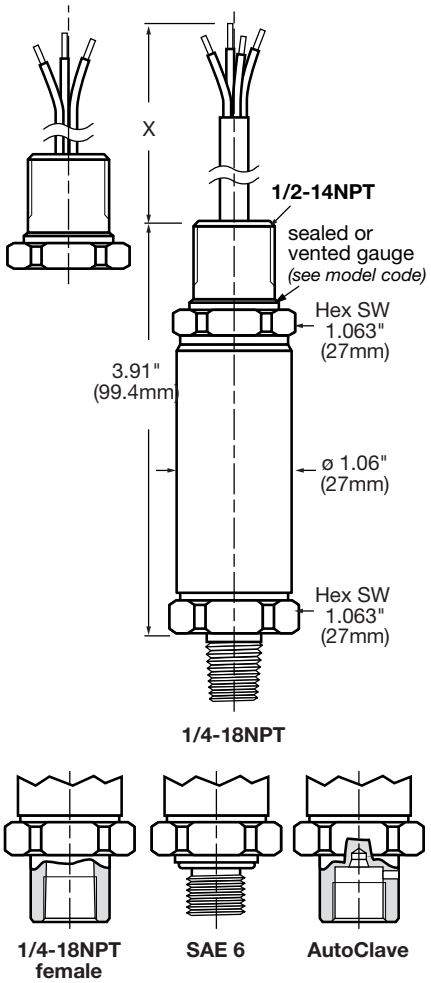
Conduit Jacketed Cable



Wire	44xG-X-1	44xG-X-2
white	SP 1	SP 1
brown	n.c.	SP 2
green	program	program*
yellow	n.c.	n.c.
grey	+ supply	+ supply
pink	0 V	0 V

See Label and instruction manual for detail on wirings.
*The programming wire has to be connected to the ground after programming.

Dimensions



ETS 4500 Series

Temperature Transducer CSA Explosion Proof, ATEX & IECEx Explosion & Flame Proof

Applications

Description

The temperature transmitter ETS 4500 series with its pressure proof hpusing and threefold approval for ATEX, CSA, and IECEx, make it universally suitable for worldwide usage in potentially explosive atmoshere applications.

All temperature transmitters are supplied and labeled with triple certification. The requirement to stock teperature transmitters for separate approvals is no longer necessary.

Based on a silicon semiconductor temperature sensor element and evaluation electronics, the temperature sensor can measure in th erange of -4° to 212°F (-20° to 100°C).

The main areas of applications for this transmitter are oil and gas *(BOP's, top drives, turn tables, control panels)* and mining *(underground vehicles, hydraulic drives)* as well as other hazardous areas.

Special Features

- Accuracy ≤ ±0.25% BFSL
- Output signal 4 to 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Approvals

$_{C}$CSA$_{US}$ Explosion Proof *(Seal Not Required)*
Class I Group A, B, C, D
Class II Group E, F, G
Class III
Type 4

ATEX Flame Proof
I M2 Ex d I
II 2G Ex d IIC T6, T5

IECEx Flame Proof
Ex d I Mb
Ex d IIC T6, T5 Gb

Technical Details,

Sensor Specifications	
Sensing technology	Silicon semiconductor device
Measuring range	-13° to 212°F (-25° to 100°C)
Sensor length - inch (mm)	0.42 (10.7), 3.94 (100), 9.84 (250), 13.8 (350)
Pressure rating psi (bar) / inch (mm)	SAE 6: 8700 (600) / 0.42 (10.7) 1/4" NPT: 1800 (125) / 3.94 (100) 1/4" NPT: 1800 (125) / 9.84 (250) 1/4" NPT: 1800 (125) / 13.8 (350)
Mechanical Connection	1/4"-18 NPT, male SAE 6 9/16-UNF 2A
Tightening Torque	SAE 6, G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40 Nm)
Parts in Contact with media	1.4571, 1.4301 (316Ti, 304) Seal: FPM (SAE 6)
Housing material	1.4404, 1.4435 (316L)
Weight	280 g / 0.42 (10.7 mm) 315 g/ 3.94 (100 mm) 350 g / 9.84 (250 mm) 385 g / 13.8 (350 mm)
Output Data	
Output Signal[1)] permitted resistance	4 to 20 mA, 2 wire, $R_{Lmax} = (U_B - 8V) / 20 mA$ [kΩ]
Accuracy	≤ ±3.0% FS max. ≤ ±1.5% FS typ.
Rise time to DIN EN 60751	T_{50}: 10s / T_{90}: 15s
Environmental Condition	
Operating temperature range[1)]	T5: -40° to 176°F (-40° to 80°C) T6: -40° to 140°F (-40° to 60°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range[1)]	T5: -40° to 176°F (-40° to 80°C) T6: -40° to 140°F (-40° to 60°C)
CE mark	EN 61000-6-1 / 2 / 3 / 4, EN 60079-0 / 1
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g
Environmental Protection to DIN 40050	IP 69K
Electrical Specifications	
Supply voltage	8 to 30V
Residual ripple suppy voltage	≤ 5%
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

1) With SAE or G1/4, in combination with FPM seal -4°F (-20°C)

Model Code

ETS 4 5 X X - A - D - XXX - 000 72 inch

Mechanical Connection
7 = SAE 6, 9/16-18 UNF 2A male
(probe length "010" only)
8 = 1/4-18 NPT, male
(probe lengths "100-350" only)

Electrical Connection
9 = Conduit connection *(1/2-14 NPT male)* with flying leads
G = Conduit connection *(1/2-14 NPT male)* with open ended cable

Signal
A = 4 to 20 mA *(2-conductor)*

Approval
D = CSA Explosion Proof - seal not required
ATEX / IECEx Flame Proof

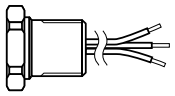
Gauge Type
010 = 0.42" (10.7 mm) *(SAE 6 only)*
100 = 3.94" (100 mm) *(1/4 NPT only)*
250 = 9.84" (250 mm) *(1/4 NPT only)*
350 = 13.8" (350 mm) *(1/4 NPT only)*

Modification Number
000 = Standard

Cable length
72 inch = standard
Other lengths upon request

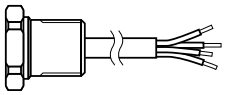
Pin Connections

Conduit



Wire	45x9-A
red	signal +
black	signal -
green/ yellow	PE/GND

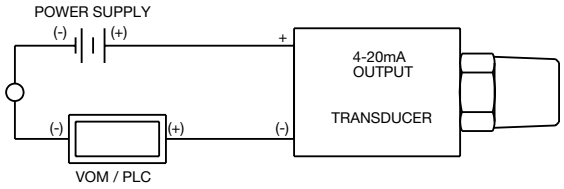
DIN 43650



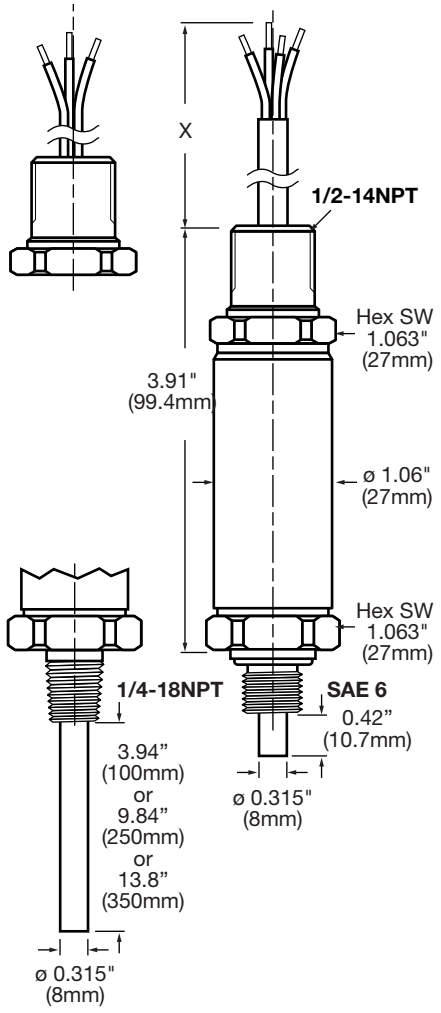
Wire	45xG-A
white	signal -
brown	signal +
green	n.c.
yellow	n.c.

See Label and instruction manual for detail on wirings.

Circuit Diagram



Dimensions

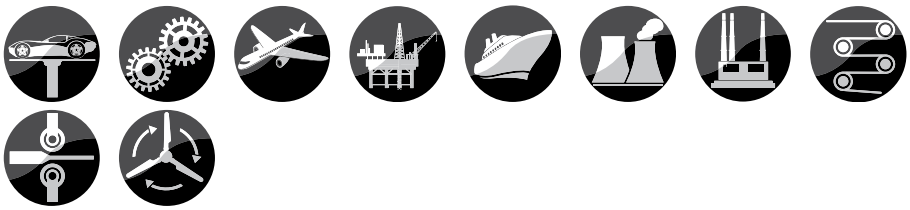


Application Areas

Protection class	$_{c}CSA_{US}$	Explosion Proof Seal Not Required	
	ATEX	Flame Proof	
	IECEx	Flame Proof	
Certificate number	ATEX KEMA 10ATEX0100 X CSA MC 224264 IECEx KEM 10.0053X		
Zones / Categories	$_{c}CSA_{US}$	Class I Class II Class III Type 4	Group A, B, C, D Group E, F, G
	ATEX	I M2 II 2G	Ex d I Ex d IIC T6, T5
	IECEx	Ex d I Mb Ex d IIC T6, T5 Gb	
Electrical Connection *(see model code)*	9; G		

HYDAC Lab
Fluid Condition Sensor

Applications



Description

HYDACLab sensors are compact, multi-functional sensors for determining the condition of fluids in real-time. Operators are kept informed of changes in fluid condition as they occur and can immediately change the operating conditions accordingly. Changes in fluid condition that might occur due to aging or mixing with other fluids, for example, are indicated by measuring fluid temperature, relative moisture content and relative changes in fluid viscosity and fluid dielectric constant. Those measurements are available as analog signals or switching signals at the electrical output of the HYDACLab for activating warning devices or alarms.

Please contact Product Management to discuss your particular application for this product.

Technical Details

Sensor Specifications	
Relative moisture content	0 to 100% of saturated concentration
Temperature measure range	-13° to 212°F
Dielectric constant (E_R)	1 to 10
Operating pressure - psi	< 725
Rated pressure - psi	8700
Fluid flow velocity	< 5m/s
Mechanical connection	G 3/4 DIN 3852 E
Tightening torque	22 lb-ft (30 Nm)
Parts in contact with media	Stainless Steel, FPM seal
Output Data - Humidity Measurement	
Output signal	4 to 20 mA at 0 to 100%
Calibration accuracy	≤ ±2% FS max
Accuracy	≤ ±3% FS typ*
Output Data - Temperature Measurements	
Output signal	4 to 20 mA for -13° to 212°F (-25° to 100°C)
Accuracy	≤ ±3% FS max
Output Data - Relative Changes in Dielectric Constant	
Output signal	12 mA ± 8 mA *(corresponds to ± 30% Initial Value)*
Accuracy	see below**
Switching Specifications	
Type	Signal 1 *(Normally Closed)* / PNP-transistor switching output / Switching level: ≥ (UB - 4 V)
Switching current	0.5 mA max.
Preset warning level SP1	Relative humidity ≥ 85% Temperature ≥ 80°C (176°F) Changes in relative dielectric constant ±15% *(temp. comp.)*
Environmental Condition	
Operating temperature range	-4° to 176°F
Storage temperature range	-40° to 194°F
Media Compatibility	HLP mineral oils *(compatibility w/ HLP-D mineral oils is optionally available)* HEES and HETG esters
CE mark	EN 61000-6-1 / 2 / 3 / 4
Environmental Protection	IP 67
Electrical Specifications	
Supply voltage, 2-wire	10 to 36 VDC
Residual ripple suppy voltage	≤ 5%
Electrical Connection	5 pole, M12x1, male
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard
Weight	Approximately 205 g

*The max. accuracy achievable when measuring relative humidity is heavily dependent on the type of fluid additive. More precise information on this is avaiable on request

**The accuracy achievable when measuring the relative change in dielectric constant is dependent on the application, the type of oil and the individual calibration of the sensor. More detailed information is available on request.

Approvals

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

*Contact factory for other ranges

**The accuracy of measurements of changes in relative dielectric constant vary according to the applications and the types of fluids involved, and the sensor's own calibration. More detailed information on this is available on request.

Model Code

HLB 1 X 0 8 - 1 C - 000 F1

Variables
3 = Temperature
= Relative Humidity
= Relatvie change in dielectric constant *(DC)*

Mechanical Connection
0 = G 3/4 A to DIN 3852

Electrical Connection
8 = M12x1 plug, 5 pole *(connector not included)*

Output Type, Signal 1
1 = NC switching signal

Output Type, Signal 2
C = 4 to 20 mA analog signal

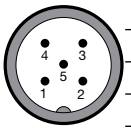
Modification Number
000 = Standard

Seal Material
F1 = FPM Seal *(hydraulic oil)*

Please contact Product Management to discuss your particular application for this product.

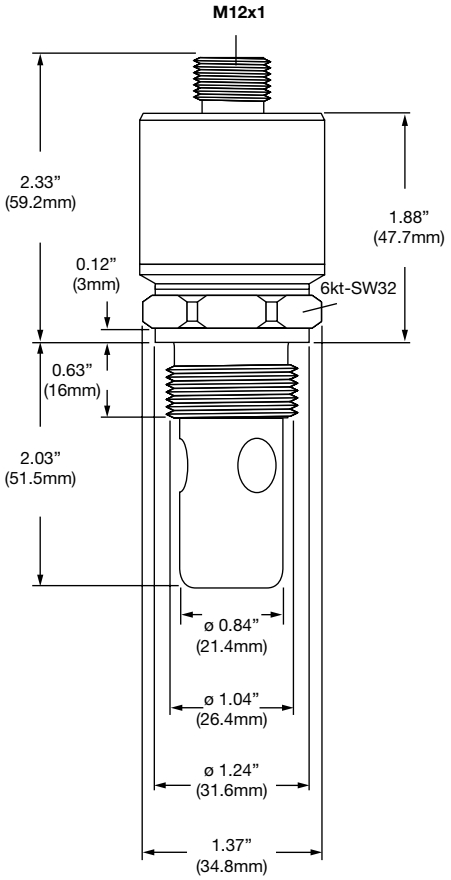
Pin Connections

M12x1, 5 pole



Pin	1308
1	$+U_B$
2	Signal 1
3	Ground
4	Signal 2
5	unused

Dimensions

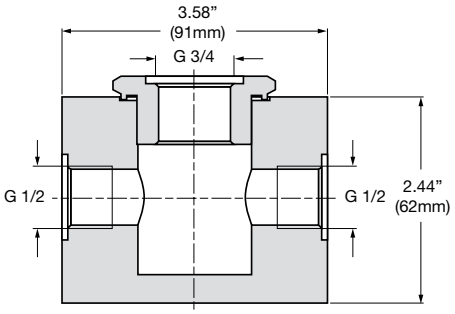


ZBM 21

Mounting Block for HYDAC LAB

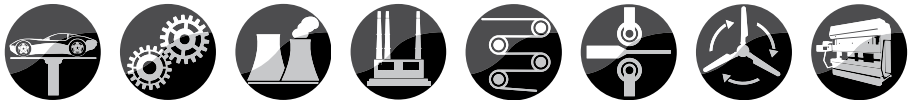
Part #03244260

Dimensions



AS 1000 Series
AquaSensor

Applications



Description

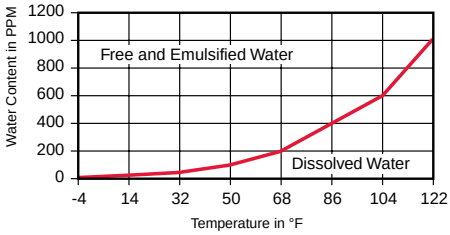
The AS 1000 series AquaSensor is a stationary, microprocessor based measurement unit for the continuous monitoring of the water saturation level and temperature in hydraulic and lubrication systems. The sensor measures the water content relative to the saturation concentration *(saturation point)* and output the degree of saturation *(saturation level)* in the range of 0 to 100% as a 4 - 20 mA signal. A reading of 0% would indicate fluid that is free of water, while a reading of 100% would indicate a fluid that is saturated with water.

Water in Oil

It is almost certain that there is water present in hydraulic and lubrication systems. These systems should be operated without the presence of free or emulsified water. The most common sources of water entering a system are ambient humidity, “splash” from process water, and new oil. Water contamination will accelerate the aging process of the oil resulting in oil oxidization, additive depletion, reduced lubrication, corrosion and damaged components. Most of these costly problems can be avoided by monitoring the water content of the operating fluids.

Sometimes the water content is difficult to determine, but with the HYDAC AquaSensor, determining the amount of water is easy! The most practical method for monitoring water content in oil is as a percent of the saturation level. Different oils are capable of dissolving varying amounts of water, therefore they have varying water saturation curves. The curve *(below)* is an example of the typical relationship of water saturation level versus fluid temperature in hydraulic and lubrication oils. By looking at the example graph it can be seen that this fluid is capable of holding more water, or has a higher saturation level, as the temperature increases.

Example of a Hydraulic Oil Saturation Curve



Technical Details

Input Data	
Measuring range *(temperature)*	-13° to 212°F (-25° to 100°C)
Measuring range *(saturation level)*	0 to 100%
Operating pressure	-7 to 725 psi
Burst pressure	≤ 9000 psi
Parts in contact with fluid	Stainless steel, FPM or EPDM seal, ceramic with evaporated metal
Output Data - Humidity Measurement	
Output signal *(saturation level)*	4 to 20 mA, 2 wire, $R_{Lmax} = (U_B - 10V) / 20\ mA\ [k\Omega]$
Calibrated accuracy	≤ ±2% FS max.
Accuracy in media measurements	≤ ±3% FS typ.
Pressure dependent	±0.2% FS / bar
Output Data - Temperature Measurement	
Output signal *(temperature)*	4 to 20 mA, 2 wire, $R_{Lmax} = (U_B - 10V) / 20\ mA\ [k\Omega]$
Accuracy	≤ ±2% FS max.
Compensated temperature range	32° to 194°F (0° to 90°C)
Operating temperature range	-40° to 212°F (-40° to 100°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-40° to 257°F (-40° to 125°C)
Viscosity range	32 to 23175 SUS (1 to 5000 cSt)
Flow velocity	< 16 ft/sec
Permissible fluids	Fluids based on mineral oil and synthetic and natural esters
CE mark	EN 61000-6-1 / 2 / 3 / 4
Type of protection acc. DIN 40050	IP67
Other Data	
Supply voltage	12 to 32 V DC
Residual ripple	≤ 5%
Thread connection	G 3/8 BSPP male thread
Torque rating	18 ft-lbs (25 Nm)
Electrical connection Pin 1: +Ub Pin 2: Signal saturation level Pin 3: 0V / GND Pin 4: Signal temperature Pin 5: HSI *(HYDAC Self Identification)*	M12x1.5 pole (DIN VDE 0627)
Reverse polarity protection of the supply voltage and short circuit protection	Standard
Weight	approx. 145 g

note: FS (Full Scale) = relative to the full measuring range

Model Code

AS 1 X 0 8 - C - 000

Series
AS = AquaSensor

Measuring Range
1 = Saturation level 0 to 100%;
Temperature -13° to 212°F (-25° to 100°C)

Fluids
0 = Mineral oils
1 = Phosphate esters (HFD-R)

Mechanical Connection
0 = G 3/8A DIN 3852

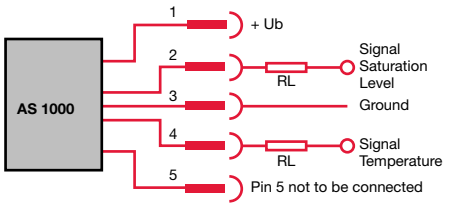
Electrical Connection
8 = Plug M12x1, 5-pole *(connector not included)*

Signal Technology
C = Saturation level 4 to 20 mA (0 to 100%),
Temperature 4 to 20 mA (-25° to 100°C)

Modification Number
000 = Standard

Items supplied
- AquaSensor
- Operation Manual

Circuit Connection



Color Codes for connectors with cables:
1 = brown
2 = white
3 = blue
4 = black
5 = gray

Accessories

ZBE 08 Connector
5 Pole M12x1 90°

ZBE 08 connector only (IP65)
Part #06006786

ZBE 08-02 with 6' cable (IP67)
Part #06006792

ZBE 08-05 with 15' cable (IP67)
Part #06006791

HDA 5500-0-0-AC-000 Display
Part #00908861

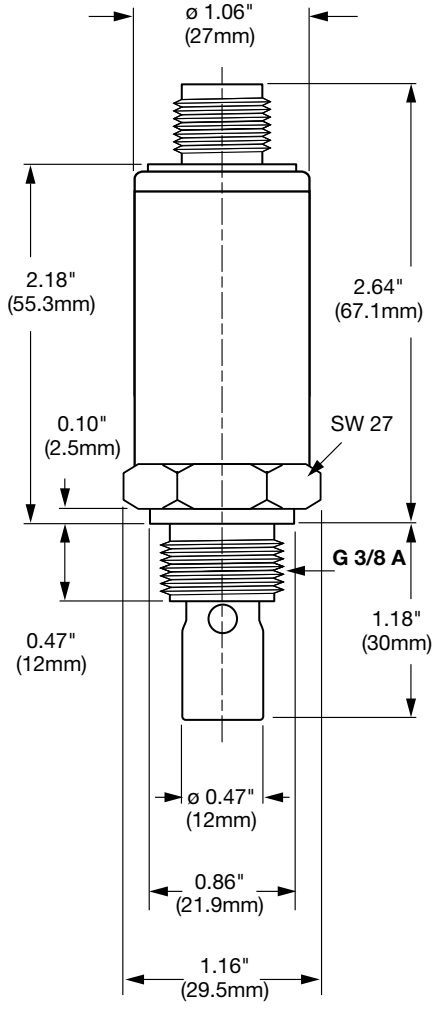
HDA 5500-0-0-DC-000 Display
Part #00908862

HDA 5500-1-0-DC-000 Display
Part #00908868

HDA 5500-1-1-AC-000 Display
Part #00908869

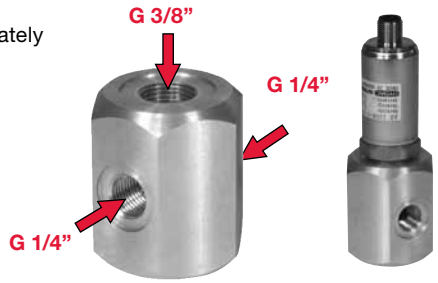
HDA 5500-1-1-DC-000 Display
Part #00908870

Dimensions

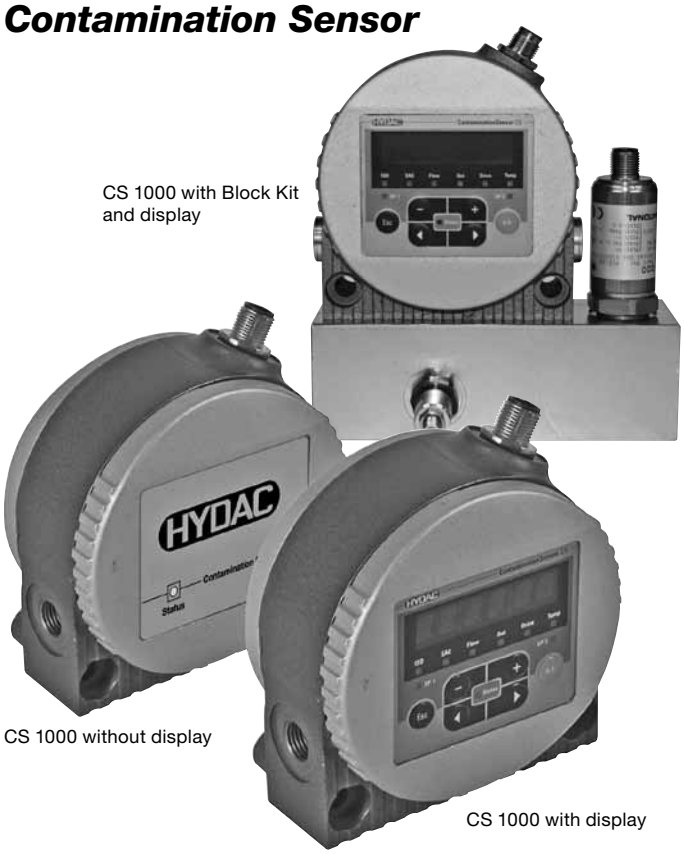


AS 1000 G1/4 Housing Block Adapter

Part #03182134
Purchase separately



CS 1000 Series
Contamination Sensor



CS 1000 with Block Kit and display

CS 1000 without display

CS 1000 with display

Description

The CS 1000 Contamination Sensor is the latest HYDAC development for continuous measurement of solid contamination of fluids.

Using the latest technology and materials, the CS 1000 is a reliable measuring instrument that is permanently mounted on your mobile or industrial equipment.

The attractive cost-to-performance ratio makes it especially interesting for OEM applications. Online, real-time condition monitoring allows you to have total predictive maintenance.

Applications

Monitoring system on vehicles such as

- Construction equipment
- Agricultural machinery
- Mobile and stationary mining equipment

Industrial hydraulic systems

- Integration into power unit monitoring systems
- Hydraulic test stands

Combination with filter unit

CS 1000 Block KIT

The Contamination Sensor Block KIT *(CS 1000 Block KIT)* combines two condition monitoring products, the CS 1000 series *(Contamination Sensor)* and the AS 1000 series *(Aqua Sensor)* into one plug and play unit. It serves as an on-line measurement of both solid contamination and water in hydraulic and lube systems.

Note: Flow control is necessary when utilizing the CS 1000 sensor. Flow must be maintained through the sensor module to ensure accurate readings. Utilization of the CS Block Kit is required to maintain Sensor flow rate range as described in the Technical Details *(at the right)*.

Features

- Versions with or without display
- Display with pivot-function
- Display with 6-digit ISO Code *(optional)*
- Measurement of solid particle contamination in hydraulic and lubricating fluids
- Compact and rugged design
- Type of protection IP67
- Max. pressure 4350 psi
- Max. viscosity 4635 SUS (1000 cSt)
- Voltage supply 9 - 36VDC
- Data output 4 - 20mA or 0 - 10 VDC

Technical Details

Self-diagnosis	Continuously with error indication via status LED
Measuring range	Display up to class ISO 7/6/5 to 28/27/26 Calibration within the range ISO 13/11/10 to 23/21/18
Contamination code	ISO 4406 : 1999 SAE AS 4059 (D)
Operation pressure	4350 psi max
Connectors Inlet Outlet	 Thread G 1/4, ISO 228 Thread G 1/4, ISO 228
Sensor flow rate	1 - 10 oz/m
Permissible viscosity range	15 - 4635 SUS (1 - 1000 cSt)
Fluid temperature range	32° to 185°F (0° to 85°C)
Power supply voltage	9 - 36 VDC, residual ripple < 10%
Power consumption	3 Watt maximum
Electrical specification 4 to 20 mA output: 0 to 10 V output:	 Max. 330 Ω Min. 820 Ω Max. current 1.5 A
Electrical outputs Analog Interfaces Limit Switching Output RS485	 4 to 20 mA (max 330 Ω) 0 to 10 VDC (min 820 Ω) Passive, n-switching power MOSFET, max current 1.5A 2 conductor cable
Operating temperature range	-22° to 176°F (-30° to 80°C)
Relative Humidity	max. 95%, non-condensing
Seal Material Hydraulic/Mineral Oil Phosphate Ester	 Fluoro-elastomer (FPM) Ethylene Propylene (EPDM)
Electrical safety class	III *(low voltage protection)*
IP class	IP67
Weight	2.9 lbs. (1.3 kg)

We do not guarantee the accuracy or completeness of this information. The information is based on average working condition. For exceptional operating conditions please contact our technical department. All details are subject to technical changes.

Model Code

CS 1 2 2 0 - A - 0 - 0 - 0 - 0 / - 000

Series
CS = Contamination Sensor

Resolution
1 = 4 Particle Size Channels

Indicator Code
2 = ISO 4406 : 1999; SAE AS 4059 (D)
>4 µm(c) >6 µm(c) >14 µm(c) >21 µm(c)
3 = ISO 4406 : 1987; NAS 1638
>2 µm >5 µm >15 µm >25 µm
ISO 4406 : 1999; SAE AS 4059 (D)
>4 µm(c) >6 µm(c) >14 µm(c) >21 µm(c)

Options
1 = without Display
2 = with Display *(270° rotation of display)*

Fluids
0 = Hydraulic/Mineral oil
1 = Phosphate Esters

Analog Interfaces
A = 4 to 20 mA
B = 0 to 10 V

Switching Output
0 = Limit Switching Output

Digital Interfaces
0 = RS485

Electrical Connection
0 = Plug M12x1, 8-pole *(connection cable not included)*

Mounting
0 = Inline version *(vertical flow mounting is recommended)*
1 = Flanged version

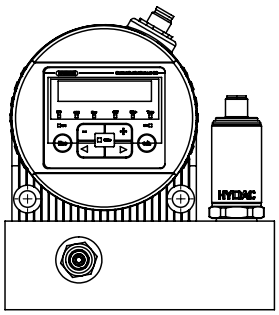
Modification Number
000 = standard
K = CS Block Kit without AS Sensor *(requires Mounting Option 1)*
KAS = CS Block Kit with AS Sensor *(requires Mounting Option 1)*

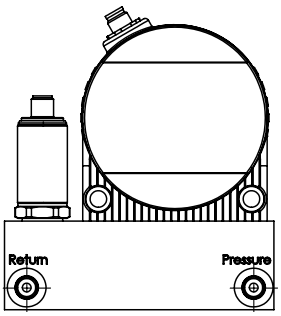
Scope Of Delivery
- Contamination sensor
- Operation and Instruction manual
- Calibration Certificate

Accessories
- Connection cable 6 ft. with M12x1 connector, screened 8-pole: Part Number 03281220
- Connection cable 16 ft. with M12x1 connector, screened 8-pole: Part Number 03281239
- Connection cable 9 ft. with M12x1 connector, 8-pole: Part Number 02091414
- CSI-D-5 Contamination Sensor Interface: Part Number 03249563

Model Codes Containing RED are non-standard items – Minimum quantities and longer lead times may apply - Contact HYDAC for information and availablity

CS 1000 Block Kit

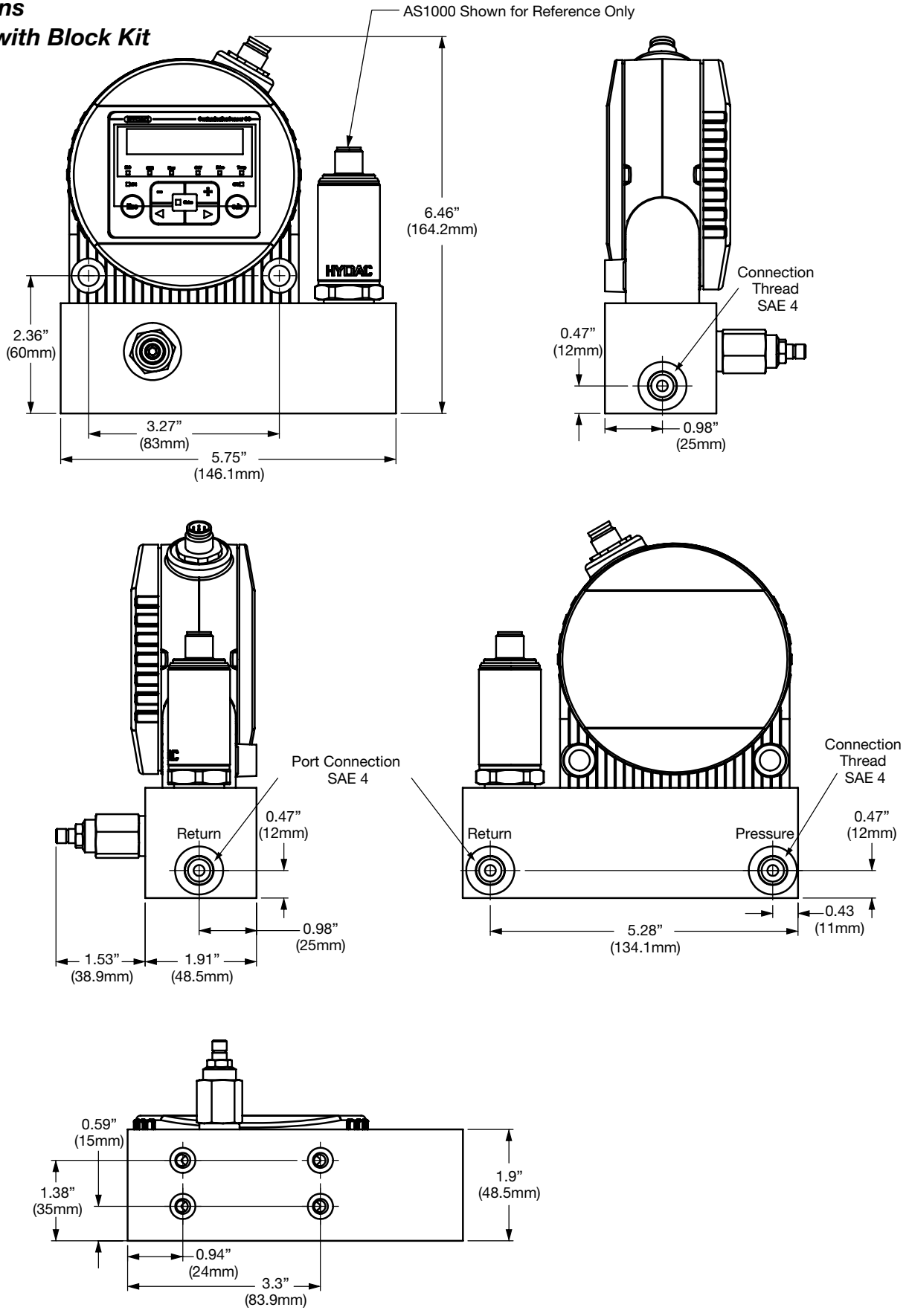




Quick Order Guide

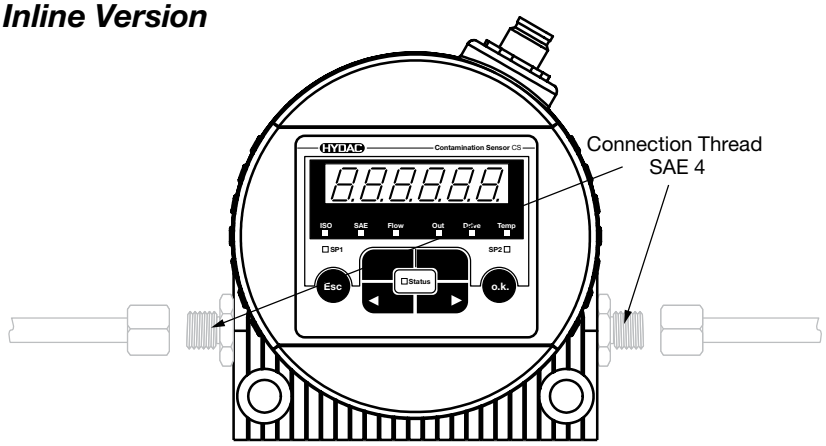
Model Code	Part Number	Description
CS1220-A-0-0-0-0 /-000	03236362	4-20mA display model
CS1210-A-0-0-0-0 /-000	03240458	4-20mA non-display model
Connection Cable	03281220	6 foot
CS1220-A-0-0-0-1 / K	02087348	4-20mA display model and CS Block Kit without AS Sensor
CS1220-A-0-0-0-1 / KAS	02086855	4-20mA display model and CS Block Kit with AS Sensor

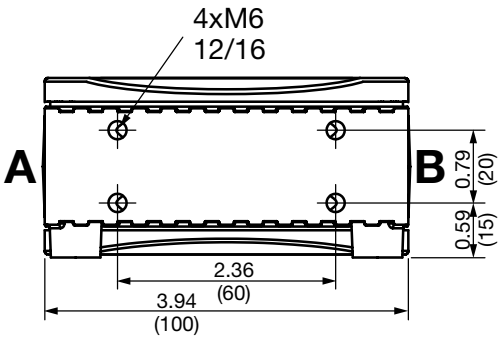
Dimensions
CS 1000 with Block Kit



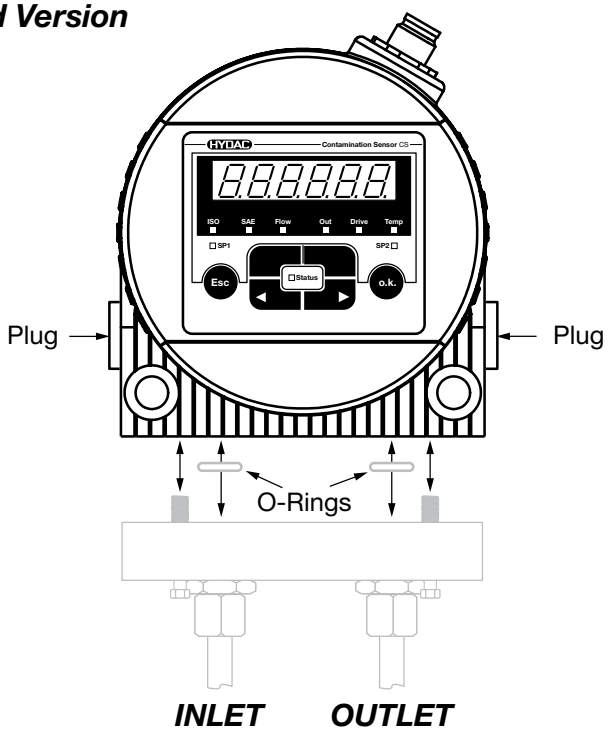
Dimensions are for general information only. All critical dimensions should be verified by requesting a certified print.

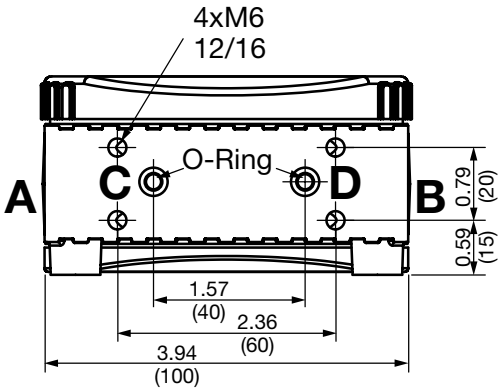
Hydraulic Connections
Inline Version



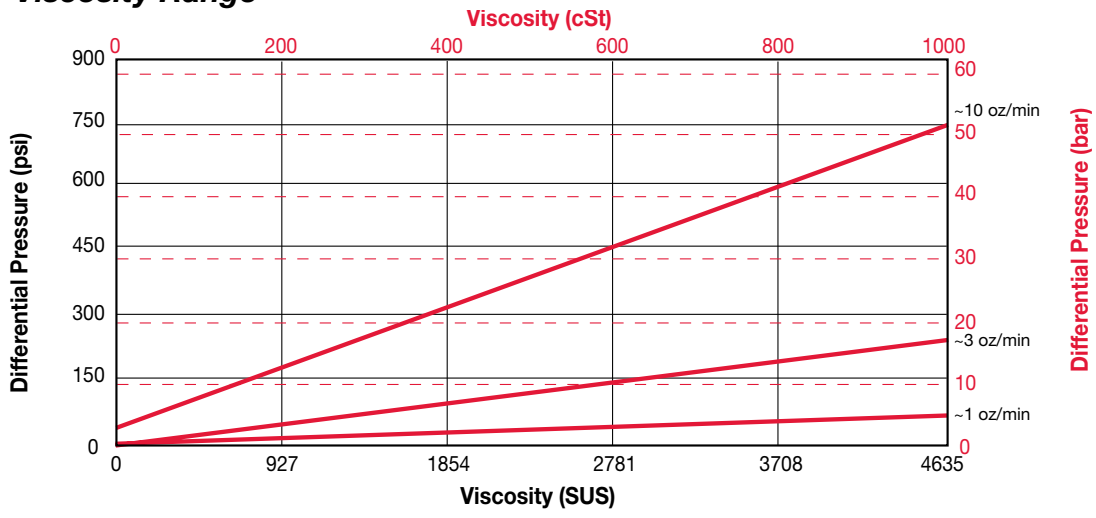


Flanged Version





Pressure - Viscosity Range



CMU 1000 Series
Condition Monitoring Unit

Applications

Description

The CMU 1000 is an electronic evaluation unit for permanent online condition monitoring of machines and systems.

In order to achieve this, the device must be supplied with relevant data which is recorded by the sensors connected to it.

This recorded data *(processed or unprocessed)* can be transferred by the CMU 1000 via different ports or as an analog value to other devices and/or monitoring levels.

The CMU 1000 processes the application program stored in it continuously and cyclically like a PLC. The user creates this program simply and conveniently using the CM Editor developed for this purpose and then uploads it to the CMU 1000.

The CM Editor is part of the HYDAC PC software CMWIN Version V03 or higher and it provides the various tools and functions in accordance with IEC 61131 for designing, integrating and testing the user program using “drag and drop” operations.

For status indication and for displaying messages and values on the device itself, there is a back-lit LCD and three different colored LEDs.

The CMU 1000 is operated and data are input on site using a built-in keypad within the menu structure of the device.

It is possible to connect easily to higher level control systems, monitoring systems and bus systems using the built-in interfaces or in combination with an additional coupling module.

Technical Details

Supply	
Input voltage	18.0 to 35.0 V DC
Current consumption max.	1.5 A *(3.5 A when CSI-F-10 connected)*
Reverse polarity protection:	-30 V
Withstand voltage	+40 V
Connection of sensors	Up to 8 sensors with HSI functionality or up to 8 SMART sensors* and in addition up to 8 analog sensors and up to 4 digital sensors 4 x digital / 2 x digital + 2 x frequency / 3 x digital + 1 x frequency
Analog inputs	
Channel I and J (Accuracy)	4 to 20 mA ≤ ±0.1% FS max. 0 to 20 mA ≤ ±0.1% FS max. 0.5 to 4.5 V ≤ ±0.1% FS max. 0 to 10 V ≤ ±0.1% FS max.
Channel K and L (Accuracy)	4 to 20 mA ≤ ±0.1% FS max. 0 to 20 mA ≤ ±0.1% FS max. 0.5 to 4.5 V ≤ ±0.1% FS max. 0 to 50 V ≤ ±0.1% FS max. -10 to +10 V ≤ ±0.2% FS max. L only!
Channel M and N (Accuracy)	4 to 20 mA ≤ ±0.1% FS max. 0 to 20 mA ≤ ±0.1% FS max. 0.5 to 4.5 V ≤ ±0.1% FS max.
Channel O and P (Accuracy)	4 to 20 mA ≤ ±0.1% FS max. 0 to 20 mA ≤ ± 0.1%FS max. 0.5 to 4.5 V ≤ ±0.1% FS max. -10 to +10 V ≤ ±0.2 %FS max. P only!
Digital Inputs	
Quantity	4, of which 2 are for frequency measurement *(Channel Q and R)*
Trigger threshold	approx. 2 V
Dynamics	30 kHz
Measurement channels Quantity	32 - A measurement channel can be a value of a connected sensor *(also a subchannel of a SMART sensor)* or a value derived *(calculated)* from sensor data.
Analog Outputs	
Quantity	2
Type	individually selectable, current *(4 to 20 mA)* or voltage *(0 to 10 V)*
Digital Outputs	
Quantity	4
Type	Relay output, change-over contact
Switching capacity	30V DC / 1 A
Calculation Unit	
Analog value recording	12 Bit A/D-converter
Interfaces	
Keypad	- 4 arrow keys *(up, down, right, left)* - OK key - ESC key
Display *(back-lit)*	- Two-line LCD *(2 x 16 characters)* - Additional indication of status information via 3 different colored LEDs is possible
USB Mass Storage Device **	- USB 1.1 / USB 2.0 full speed Port for connecting a mass storage device *(memory stick)* - Female connection type “A”.
Ethernet, supported protocols	- RJ 45 8/8 Ethernet interface - HTTP Server - OPC Client
Serial Interface 0 *(UART 0)*	- Implementing an RS 232 or an HSI master interface - Change-over user-programmable *(optional IO-Link also possible)* - Connection via plug-in terminals - No handshake lines
HSI Master	Cascading the CMU
USB Device	- USB 1.1 / USB 2.0 full speed Port for connecting a PC / Notebook to configure the CMU - Female connection type “B”.

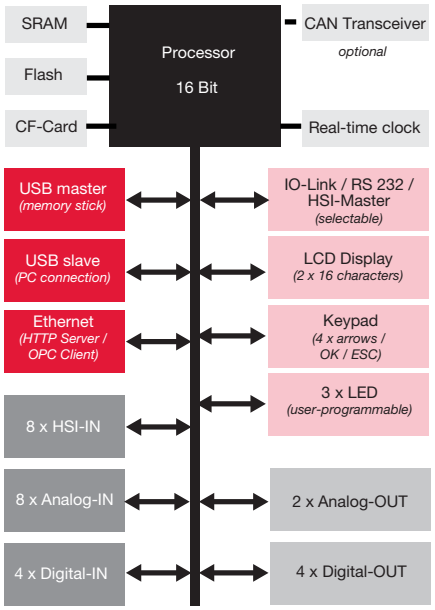
Approvals

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

CAN Bus Interface	Can be integrated as an option
IO Link Interface	Can be integrated as an option
Cycle Time	Independently determined at start of program. Display of actual cycle time is possible in the CM Editor
Operating and Ambient Conditions	
Operating temperature	-4° to 158°F (-20 to 70°C)
Storage temperature	-22° to 176°F (-30 to 80°C)
Relative humidity	0 to 70%, non-condensing
Dimensions	approx. 8.35" x 4.17" x 1.42" (212 x 106 x 36 mm)
Weight	approx. 600 g
Technical Standards	
EMC	EN 61000-6-1 / 2 / 3 / 4
Safety	EN 61010
Protection class	IP 40

*SMART sensors *(Condition Monitoring Sensors)* are a generation of sensors from HYDAC, which can provide a variety of different measured values.
**Recorded data from the CMU can be transferred to a memory stick via this interface. The USB Host supports mass storage devices exclusively.

Block Circuit Diagram



Special Features

- 8 input channels for HSI or SMART sensors
- 8 input channels for analog sensors
- 4 input channels for digital signals
- 2 output channels for analog signals
- 4 relay switching outputs with change-over contacts
- USB slave port for PC connection
- USB master port for storing measured data on a standard memory stick
- Ethernet interface
- RS 232 port
- 2-line LCD *(2 x 16 characters)* to display measured data and status and/or error messages
- 3 user-programmable, different colored LEDs for status indication *(red, yellow, green)*
- Simple operation using navigation pad
- Creation of customized application program using PC software CMWIN supplied

Model Code

CMU 1000 – 000 – X

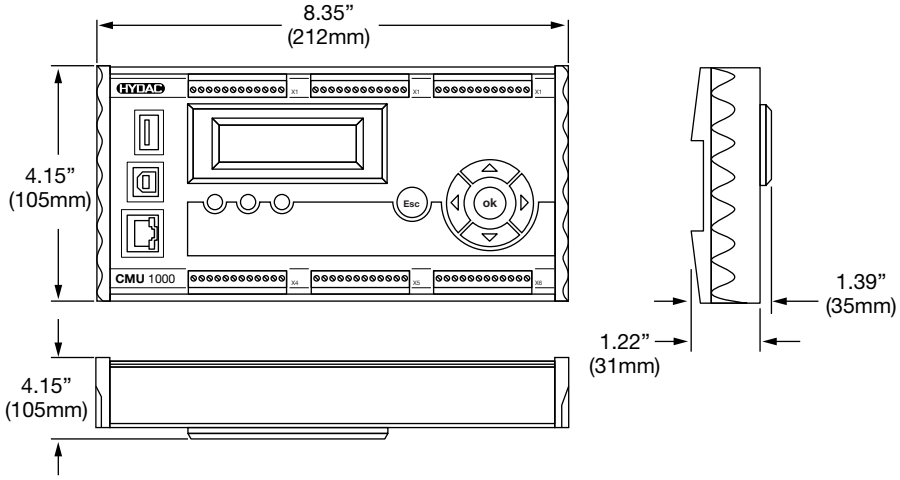
Modification number
000 = Standard

Operating Manual and Documentation
D = German
E = English
F = French

Note: On units with a different modification number, please read the label or the technical amendment details supplied with the unit.

Accessories:
Appropriate accessories, such as sensor lines for the electrical connection, can be found in the Accessories section.

Dimensions



CSI-F-10 Series
GSM Radio Module

Applications

Description

The GSM radio module CSI-F-10 is an all-purpose electronic unit for transferring data and digital signals via the GSM mobile radio network. As part of the HYDAC Condition Monitoring concept, among other functions, the CSI-F-10 links the sensor level with the interpretation level.

The unit is designed both for stand alone operation and for use as a GSM modem on a CMU 1000 *(HYDAC Condition Monitoring Unit)*.

Up to two HYDAC SMART sensors such as HYDACLab®, AS 1000 or CS 1000 can be connected to its input sockets. In addition it is also possible to monitor various different system conditions via the four integrated digital inputs and to relay the data in binary form with the aid of the two integrated digital outputs. Through these digital outputs the device can also access the monitored machine / system directly.

The CSI-F-10 processes and monitors the input signals using the application program stored in it. Which data are to be monitored, and how, and at what point a particular message is sent, is defined in detail in this program.

This application program can be created easily and conveniently *(in accordance with IEC 61131)* using the CM Editor, which forms part of the HYDAC PC software CMWIN Version V03 or higher.

Depending on the application, the user can choose independently between two operating modes of the CSI-F-10 and hence define the type and content of the communication.

Special Features

- Status indication for:
  - Network strength (4 LEDs)
  - Signals (2 LEDs, programmable)
  - Device status (1 LED)
  - GSM status (1 LED)
- Can be connected to CMU 1000
- Simplest form of programming using “Drag & Drop” on user interface
- Up to 5 telephone numbers can be stored *(for access via GSM)*

Technical Details

Supply		
Input voltage	10.5 to 35.0 V DC	
Residual ripple	≤ 5%	
Current consumption without sensors and outputs	Typically	≤ 90 mA in stand-by mode ≤ 200 mA for radio connection
	Pulsed:	≤ 2 A *(recomm. power supply 3.5 A)*
Reverse polarity protect.	-35 V	
Sensor Inputs		
Quantity	for 2 SMART sensors	
Output voltage	$+U_B$ – 0.5 V	
Current supply	500 mA max. at 50°C	
Logic Measurement Channels Quantity	32 - A measurement channel can be a sub-channel of a SMART sensor* or a value derived *(calculated)* from sensor data.	
Digital Inputs		
Quantity	4	
Input voltage	0 to 35 V DC	
Trigger threshold	Low: < 0.8 V; High: > 5.0 V	
Current consumption	approx. 4 mA	
Output voltage	$+U_B$ – 0.5 V	
Current supply *(incl. outputs)*	500 mA max. at 50°C	
Digital Outputs		
Quantity	2	
Switching capacity *(per output)*	$+U_B$ Out x 0.2 A	
Interfaces		
HSI bus		
Mobile radio network	GSM 850/950 (2 W EGSM) GSM 1800/1900 (1 W EGSM)	
Antenna	50Ω FME plug	
SIM	3V SIM card	
Operating Conditions		
Operating temperature	-4 to 130°F (-20° to 55°C) (GSM 850/900) -14 to 130°F (-25° to 55°C) (GSM 1800/1900)	
Storage temperature	-22 to 150°F	
Relative humidity	0 to 70 %, non-condensing	
Dimensions and Weight		
Dimensions	approx. 5.6” x 3.8” x 2.2” without antenna	
Weight approx.	350 g	
Technical Standards		
EMC	Conforms to R&TTE Directive 1999/5/EC	
CE mark	EN 61000 - 6 - 1 / 2 / 3 / 4	
Safety	EN 60950 / EN 61010	
Protection class	IP 65	

*SMART sensors *(Condition Monitoring Sensors)* are a generation of sensors from HYDAC, which can provide a variety of different measured values.

- Parameters can be set online
- Sensors connected via M12x1 male connector
- Very compact design

Approvals

CE CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Model Code

CSI - F - 10 - 0 - 000 - X

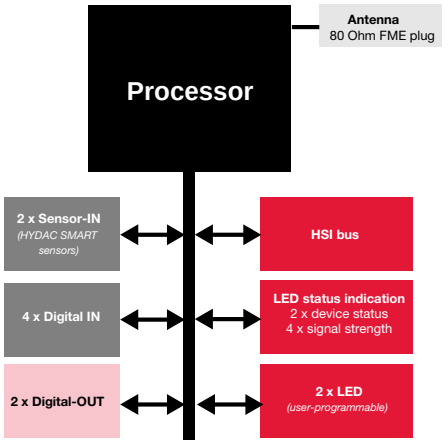
Modification Number
000 = Standard

Operating Manual and Documentation
D = German
E = English
F = French

Note: On units with a different modification number, please read the label or the technical amendment details supplied with the unit.

Accessories: Appropriate accessories, such as sensor lines for the electrical connection, can be found in the Accessories section.

Block Circuit Diagram

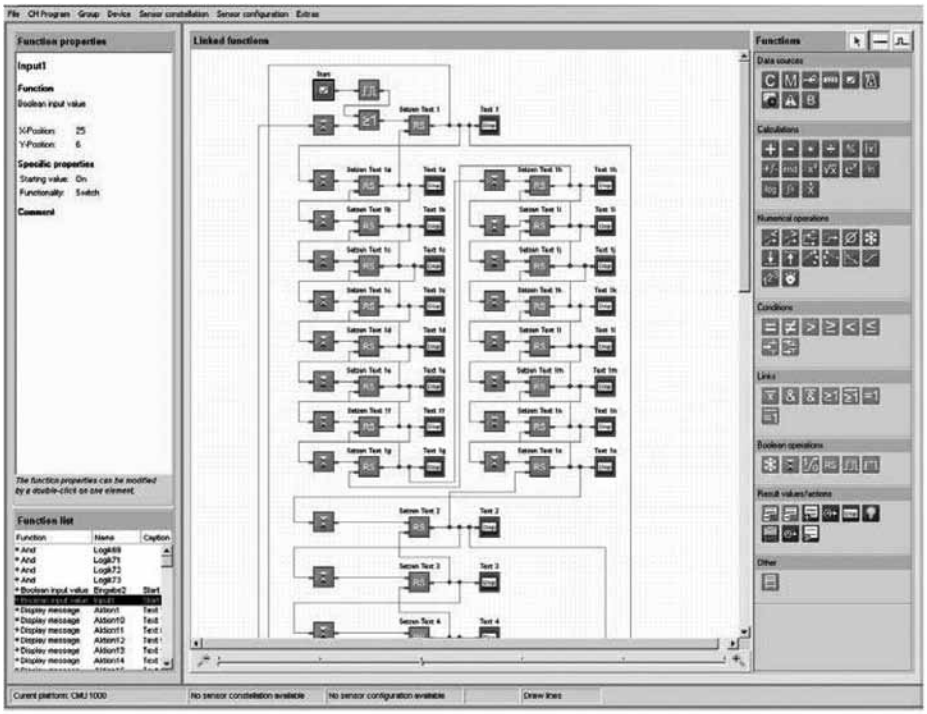


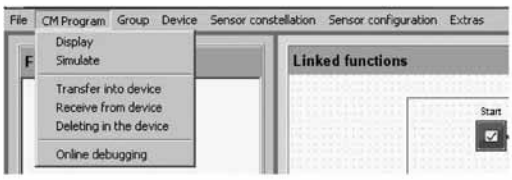
CM Editor

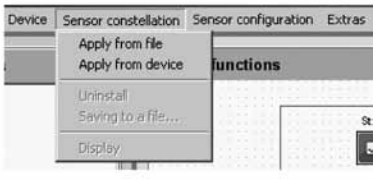
The CM Editor is part of the HYDAC PC software CMWIN Version 03 or higher and provides a wide variety of tools and functions for designing, integrating and testing the application program.

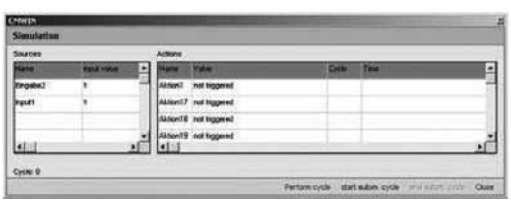
An application program consists of many individual functions which can be linked together. During subsequent operation, this user program is processed as for a PLC, cyclically.

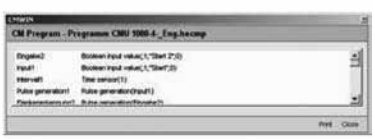
The program is created according to the IEC 61131 *(the standard for PLC programming)*.



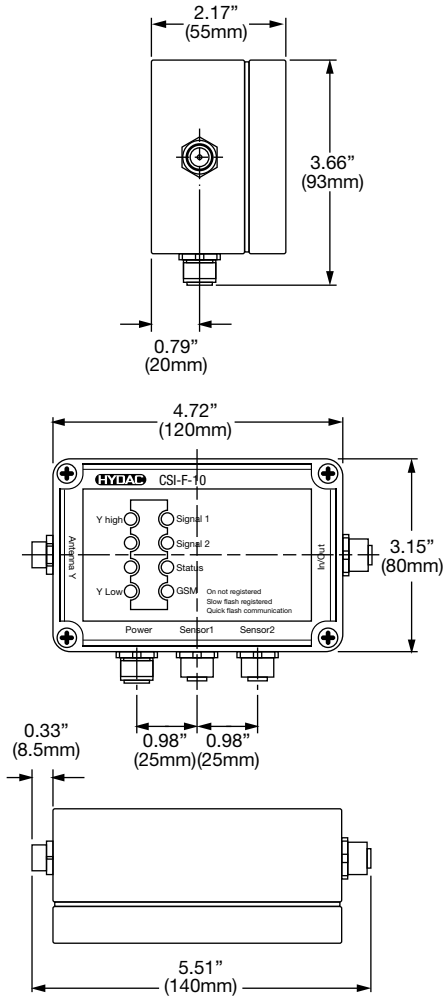




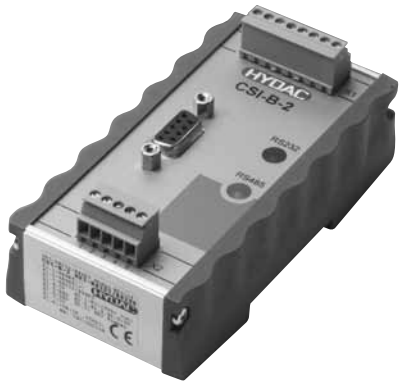




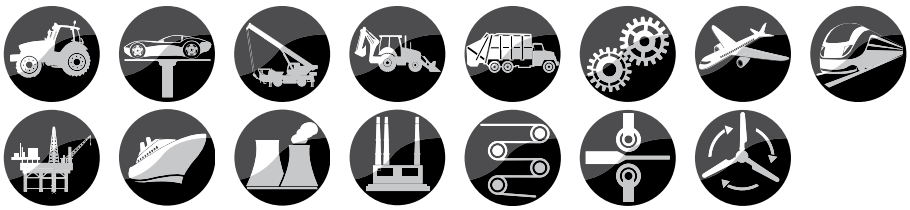
Dimensions



CSI-B-2 Series
Condition Monitoring Interface Module



Applications



Description

The Condition Monitoring Interface Module CSI-B-2 is another element in the HYDAC Condition Monitoring concept which connects the sensor level with the interpretation level.

It is an all-purpose electronic unit for converting the HSI signal from HYDAC SMART sensors into a standardized PC signal.

Using the HYDAC “CMWIN” PC software, it is possible to read the data and measured values of the connected SMART sensors directly.

The long-term memory can also be read, as well as making adjustments and setting parameters directly on the connected sensor *(the setting options depend on the particular sensor)*.

The HSI signal can be converted either into an RS 232 or an RS 485 signal. The CSI-B-2 can be connected to any PC via the RS 232 interface *(and possibly an additional standard RS 232-USB adapter*)*.

The RS 485 interface and appropriate additional coupling modules can also be used to connect to higher-level control and/or bus systems.

Special Features

- 1 input channel for HYDAC SMART sensors
- Direct connection of the sensor via screw-type terminals
- Indication of the active interface via LED (RS 232 / RS 485)
- Very compact design
- Suitable for mounting on standard DIN rails
- Protection class IP 40

*RS 232-USB adapter is not supplied with the unit.

Approvals

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Technical Details

Input data	
HSI interface	HYDAC Sensor Interface for linking sensors digitally - male connection X2
Output data	
Signal output	Switchable: RS485 half duplex or RS232 - male connection X1 - SUB-D 9 pole connection (RS232)
Operating conditions	
Operating temperature range	-13° to 185°F (-25° to 85°C)
Storage temperature range	-22° to 185°F (-30° to 85°C)
Relative humidity	0 to 70%, non-condensing
CE mark	EN 61000-6-1, EN 61000-6-2 EN 61000-6-3, EN 61000-6-4
Protection class to DIN 40050	IP 40
Other data	
Supply voltage	18 to 35 V DC *(male connection X1)*
Current capacity *(module + sensor)*	30 mA to 400 mA max. *(depending on the supply voltage and the sensor connection)*
Sensor power supply	15 V DC ±5% / 300 mA max. at 75°F (23°C) *(male connection X2)*
Electrical connection X1: module supply + RS232 / RS485 X2: sensor supply + HSI SUB-D: RS232	Max. cross section of connection 1.5mm2 Male terminal block, 8 pole RM 3.5 Male terminal block, 5 pole RM 3.5 9 pole connection with securing screws
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard
Option of conversion mode	Option of HSI - RS232 or HSI - RS485 via jumper (bridge): X1.3 - X1.4 open: HSI - RS232 X1.3 - X1.4 closed: HSI - RS485
Indication of active conversion mode	Green LED: HSI - RS232 Yellow LED: HSI - RS485
Housing	Dimensions: 2.2 x 4.1 x 1.2 in (55 x 105 x 31mm) Housing to be mounted on rails (35mm) to DIN EN 60715 TH 35 *(formerly DIN EN 50022)*
Weight	approx. 140 g

Model Code

CSI - B - 2 - 000

Modification Number
000 = Standard

Note: On units with a different modification number, please read the label or the technical amendment details supplied with the unit.

Accessories: Appropriate accessories, such as sensor lines for the electrical connection can be found in the Accessories section.

Terminal Assignment

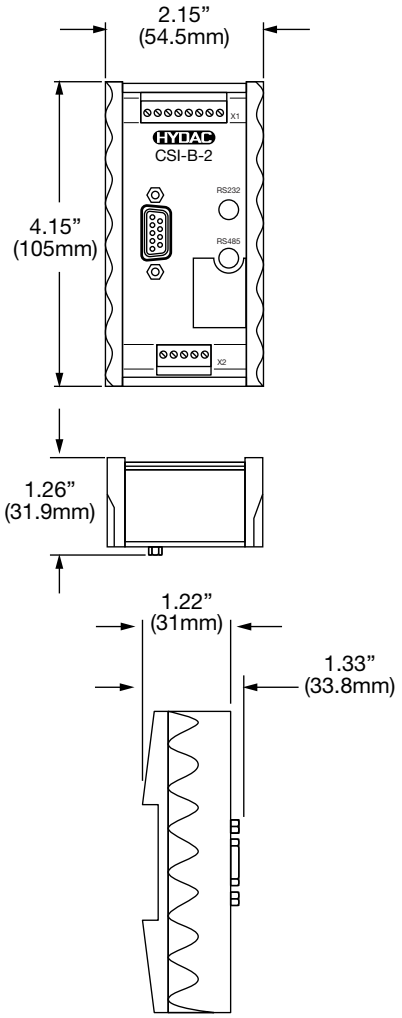
Terminal strip -X1

Pin	Signal	
1	RS 485 (-)	
2	RS 485 (+)	
3	3 – 4 open:	HSI to RS 232
4	3 – 4 closed:	HSI to RS 485
5	RxD RS 232 *(connected to Pin 3 SUB-D 9 pole)*	
6	TxD RS 232 *(connected to Pin 2 SUB-D 9 pole)*	
7	0 V *(connected to Pin 5 SUB-D 9 pole)*	
8	$+U_B$ *(18 to 35 V DC)* Module supply	

Terminal strip -X2

Pin	Signal
1	$+U_B$ (15 V DC) Sensor supply
2	0 V
3	HSI signal
4	0 V
5	0 V

Dimensions



Min of 500 pieces required per year

HDA 8000 Series
Pressure Transducer

Applications

Description

The pressure transmitter series HDA 8400 has been specifically developed for the OEM market, e.g. in mobile applications. Like most of our pressure transmitter series, the HDA 8000 is based on a robust, long-life thin-film sensor.

All parts *(sensor and pressure connection)* which are in contact with the fluid are made of stainless steel and are welded together. This means there are no possible sites of leakage inside the sensor. Leakage is eliminated.

The pressure transmitters are available in various pressure ranges from 0 to 500 psi to 0 to 9000 psi. For integration into modern controls, standard output signals are available, e. g. 4 to 20 mA, 0 to 5 V, 1 to 6 V or 0 to 10 V. Ratiometric output signals are also available.

For the electrical connection, various built-in connections are available. A basic accuracy of max. ≤ ±1% FS, combined with a small temperature drift, ensures a broad range of applications for the HDA 8400.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Outstanding performance in terms of temperature effect and EMC
- Very compact design
- ECE type approval
  (approved for road vehicles)

Approvals

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Technical Details

Sensor Specifications	
Measuring ranges - psi	500, 750, 1000, 1500, 3000, 5000, 6000, 9000
Overload pressure - psi	1160, 1160, 2900, 2900, 7250, 11600, 11600, 14500
Burst pressure - psi	2900, 2900, 7250, 7250, 14500, 14500, 29000, 29000
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* SAE 6 9/16-18 UNF 2A *(psi ranges only)* SAE 4 7/16-20 UNF 2A *(psi ranges only)*
Tightening torque	G1/4: 15 lb-ft (20 Nm) SAE: 15 lb-ft (20 Nm) SAE 4: 11 lb-ft (15 Nm)
Parts in contact with media	Stainless Steel; FPM seal
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL
Temperature compensation zero point	≤ ±0.008% FS / °F typ. ≤ ±0.014% FS / °F max.
Temperature compensation over range	≤ ±0.008% FS / °F typ. ≤ ±0.014% FS / °F max.
Rise time	≤ 2 ms
Long-term drift	≤ ± 0.3% FS typ. / year
Life expectancy	10 million load cycles (0 to 100% FS)
Weight	Approximately 55 g
Output Signal	4 to 20 mA, 2 wire, 0-5V, 1-6V, 0-10V 0.5-4.5V ratiometric 0.5-4.5V @ 5V supply (10-90%)
Environmental Condition	
Compensated temperature range	-13° to 185°F (-25° to 85°C)
Operating temperature range	-40° to 212°F (-40° to 100°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-40° to 257°F (-40° to 125°C)
CE mark	EN 61000-6-1 / 2 / 3 / 4
Vibration resistance to DIN EN 60068-2-6 at 5 to 2000 Hz	≤ 25g
Environmental protection	IP 67 or IP 69K *(depending on electrical connector)*
Electrical Specifications	
Supply voltage, 2-wire	8 to 30 VDC
Supply voltage, 3-wire	12 to 30 VDC 5 VDC ± 5% *(ratio metric)*
Residual ripple suppy voltage	≤ 5%
Max Supply current, 3-wire	approximately 25 mA
Electrical connection	M12x1, 4-pole AMP DIN 72585 Baj., 3-pole Deutsch DT04-3P, 3-pole Deutsch DT04-4P, 4-pole AMP Superseal, 3-pole Packard Metri Pack Series 150, 3-pole AMP Junior Power Times, 3-pole 1 m open ended cable
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

Model Code

HDA 8 4 X X - X - XXXX - 000

Mechanical Connection
- 4 = G 1/4 A DIN 3852 *(bar ranges only)*
- 6 = SAE 4, 7/16-20 UNF2A male *(psi ranges only)*
- 7 = SAE 6, 9/16-18 UNF2A male *(psi ranges only)*

Electrical Connection
- 1 = 1 m open ended cable
- 6 = M12x1 plug, 4 pole
- F = AMP DIN 72585 code 1, 3 pole
- H = Packard metri pack series 150, 3 pole
- K = Deutsch DT04-3P, 3 pole
- L = AMP superseal, 3 pole
- M = AMP junior power times, 3 pole
- V = Deutsch DT04-4P, 4 pole

Output Signal
- A = 2 conductor, 4-20 mA
- B = 3 conductor, 0-10V
- G = 3 conductor, *(please specify output voltage)*
- R = 3 conductor, 0.5 to 4.5V @ 5V Supply *(up to 90% of supply voltage)*

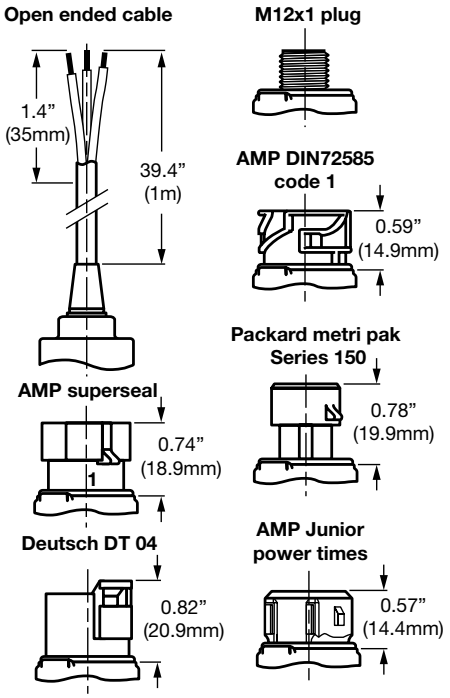
Pressure Range

0500, 750, 1000, 3000, 5000, 6000, 9000 psi
bar ranges upon request

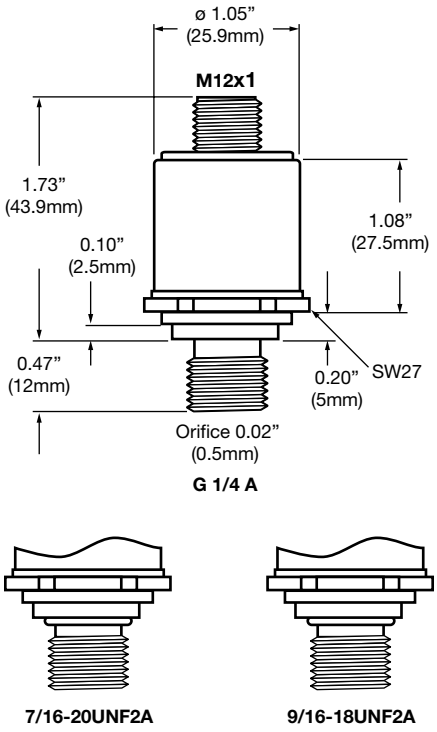
Modification Number
- 000 = Standard

*** Specifications must be submitted by customer.**

Plug Connection



Dimensions



Min of 25 pieces required

EDS 410 Series
Factory Set Pressure Switch

Applications

Description

The electronic pressure switch EDS 410 has been specially developed for use in volume production machines, and is based on the EDS 4000 pressure switch series.

The EDS 410 is available with 1 or 2 transistor switching outputs (PNP), which can be defined as either N/C or N/O.

The switching and switch-back points of the EDS 410 are factory-set according to customer specification.

As with the EDS 4000 standard model, the EDS 410 has a ceramic measurement cell with thick-film strain gauge for measuring relative pressure in the low pressure range, and a stainless steel measurement cell with thin-film strain gauge for measuring in the high pressure range.

Various pressure ranges between 0 to 15 psi and 0 to 9000 psi as well as different electrical and mechanical connection types are available.

Special Features

- 1 or 2 transistor switching outputs (PNP), either as N/C or N/O
- Factory-set according to customer specification
- Accuracy ≤ ±.05% BFSL
- Highly robust sensor cell
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

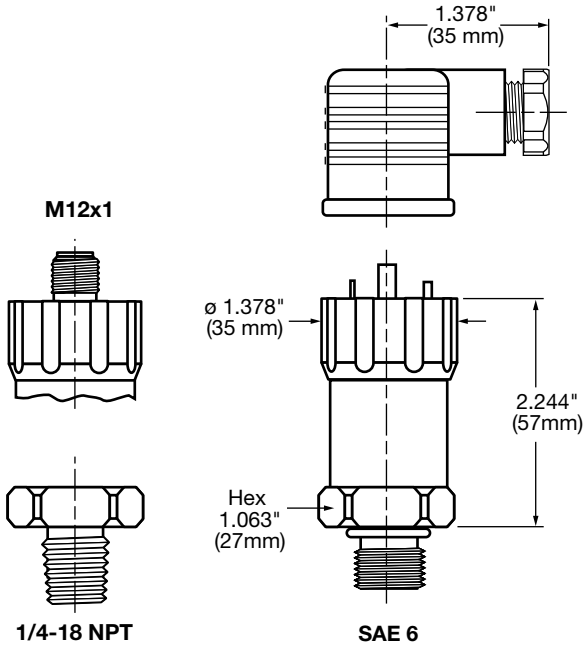
Approvals

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Technical Details

Sensor Specifications	
Measuring ranges -psi	-14.5 to 75, 15, 30, 50, 100, 150, 250, 500, 1000, 1500, 3000, 5000, 6000, 9000
Overload pressure -psi	290, 45, 100, 150, 290, 450, 725, 11600, 2900, 2900, 7250, 11600, 11600, 14500
Burst pressure -psi	400, 70, 150, 250, 400, 650, 1000, 2900, 7250, 7250, 14500, 29000, 29000, 29000
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)* SAE 6 9/16-18 UNF 2A *(psi ranges only)*
Tightening torque	SAE 6, G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 ft-lb (40 Nm)
Parts in contact with media	Stainless steel, ceramic, FPM or EPDM
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.
Temperature compensation zero point	≤ ±0.0085% / °F typ. ≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ. ≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year
Life expectancy	10 million load cycles (0 to 100% FS)
Weight	Approximately 150 g
Switching Specifications	
Type	1 or 2 PNP transistor output (N/O or N/C)
Output load	1.2 A per output
Repeatability	≤ ±0.1% FS max at 77°F (25°C)
Set point	to be specified by customer
Reset point	to be specified by customer
Switching cycles	≥ 100 million
Switch delay time	32 ms *(standard)* 8 to 2000ms to be specified by customer *(in 8ms steps)*
Environmental Condition	
Compensated temperature range	-13° to 185°F (-25° to 85°C)
Operating temperature range	-40° to 185°F (-40° to 85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-40° to 212°F (-40° to 100°C)
CE mark	EN 61000-6-1/2/3/4
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g
Environmental Protection	IP 65, IP 67 (depending on electrical connection)
Electrical Specifications	
Supply voltage	8 to 32 VDC fuse protection I ≤ 5 A *(provided by customer)*
Residual ripple suppy voltage	≤ 5%
Max supply current, 3-wire	25 mA *(plus switching current)*
Electrical connection	Connector DIN 43650 M12x1, 4-pole others upon request
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

Dimensions


1.378"
(35 mm)
M12x1
ø 1.378"
(35 mm)
2.244"
(57mm)
Hex
1.063"
(27mm)
1/4-18 NPT
SAE 6

Min of 100 pieces required per year

EDS 710 Series
Factory Set Pressure Switch

Applications

Description

The electronic pressure switch EDS 710 has been specially developed for use in large volume production machines.

The highly compact unit has a very robust pressure sensor with thin-film strain gauge on a stainless steel membrane.

The EDS 710 is available with 1 or 2 transistor switching outputs (PNP), which can be defined as either N/C or N/O.

The switching and switch-back points of the EDS 710 can be permanently factory-set according to customer specification.

Various pressure ranges between 0 to 230 psi and 0 to 9000 psi are available.

Special Features

- 1 or 2 transistor switching outputs (PNP), either as N/C or N/O
- Factory-set according to customer specification
- Accuracy ≤ ±0.5% BFSL
- Highly robust sensor cell
- Highly compact design
- Very small temperature error

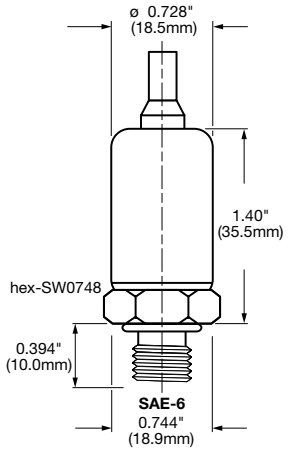
Approvals

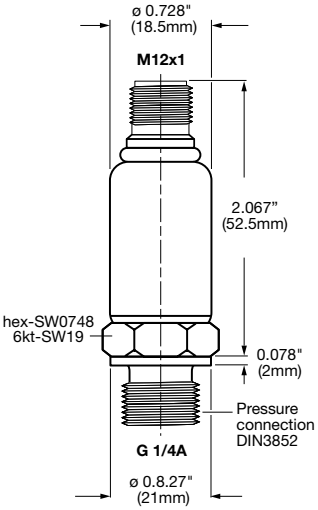
CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Technical Details,

Sensor Specifications	
Measuring ranges - psi	500, 750, 1000, 1500, 3000, 6000, 9000
Overload pressure - psi	1160, 2900, 2900, 7250, 11600, 14500
Burst pressure - psi	2900, 2900, 7250, 7250, 14500, 29000, 29000
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* SAE 6 9/16-18 male *(psi ranges only)*
Tightening torque	15 lb-ft (20 Nm)
Parts in contact with media	Stainless steel
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL
Temperature compensation zero point	≤ ±0.0085% / °F typ. ≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ. ≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year
Life expectancy	10 million load cycles (0 to 100% FS)
Weight	Approximately 60 g
Switching Specifications	
Type	1 or 2 PNP outputs (N/C or N/O)
Repeatability	≤ ±0.5% FS max.
Switching current	400 mA per output
Switch point	to be specified by customer
Switch-back point	to be specified by customer
Switching cycles	≥ 100 million
Switch delay time	approx. 32 ms *(standard)* 8 to 2000ms to be specified by customer *(in 8ms steps)*
Environmental Condition	
Compensated temperature range	-13° to 185°F (-25° to 85°C)
Operating temperature range	-40° to 185°F (-40° to 85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-40° to 212°F (-40° to 100°C)
CE mark	EN 61000-6-1 / 2 / 3 / 4
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g
Environmental protection	IP 67 *(w/ ZBE 06 molded cable or flying lead)*
Electrical Specifications	
Supply voltage	10 to 30 VDC
Residual ripple suppy voltage	≤ 5%
Max supply current, 3-wire	25 mA *(plus switching current)*
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

Dimensions

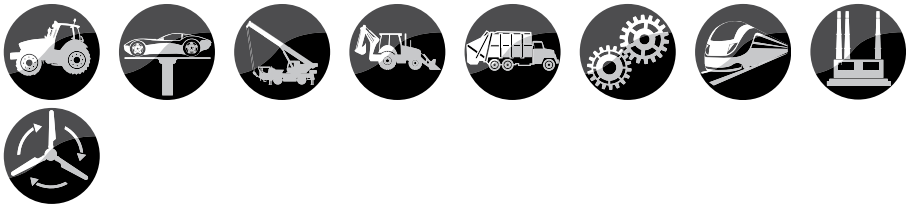

ø 0.728"
(18.5mm)
1.40"
(35.5mm)
hex-SW0748
0.394"
(10.0mm)
SAE-6
0.744"
(18.9mm)


ø 0.728"
(18.5mm)
M12x1
2.067"
(52.5mm)
hex-SW0748
6kt-SW19
0.078"
(2mm)
Pressure
connection
DIN3852
G 1/4A
ø 0.8.27"
(21mm)

Min of 500 pieces required per year

EDS 810 Series
Factory Set Pressure Switch

Applications



Description

The electronic pressure switch EDS 810 has been specially developed for use in volume production machines.

The highly compact unit has a very robust pressure sensor with thin-film strain gauge on a stainless steel membrane.

The transistor switching output is available with either N/C or N/O function.

The switching and switch-back point of the EDS 810 is factory-set according to customer specification.

Various pressure ranges between 0 to 500 psi and 0 to 9000 psi are available.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Outstanding performance in terms of temperature effect and EMC
- Very compact design
- ECE type approval
  (approved for road vehicles)

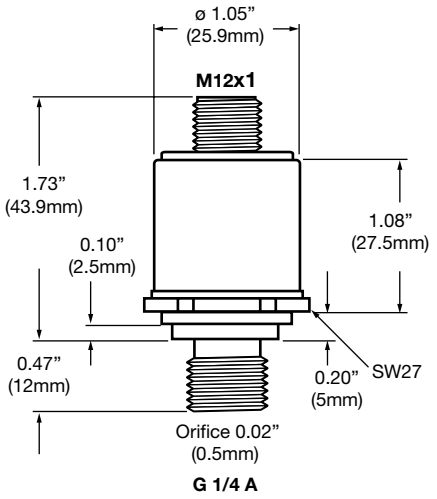
Approvals

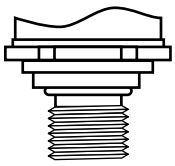
CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Technical Details,

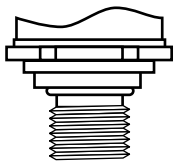
Sensor Specifications	
Measuring ranges - psi	500, 750, 1000, 1500, 3000, 6000, 9000
Overload pressure - psi	1160, 1160, 2900, 2900, 7250, 11600, 14500
Burst pressure - psi	2900, 2900, 7250, 7250, 14500, 29000, 29000
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* SAE 6 9/16-18 male *(psi ranges only)* SAE 4 7/16-20 UNF 2A male
Tightening torque	SAE 6, G1/4: 15 lb-ft (20 Nm) SAE 4: 11 ft-lb (15Nm)
Parts in contact with media	Stainless steel, FPM seal
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.
Temperature compensation zero point	≤ ±0.0085% / °F typ. ≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ. ≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year
Life expectancy	10 million load cycles (0 to 100% FS)
Weight	Approximately 55 g
Switching Specifications	
Type	1 or 2 PNP outputs (N/C or N/O)
Repeatability	≤ ±0.1%
Switching current	500 mA per output
Set point	to be specified by customer
Reset point	to be specified by customer
Switching cycles	≥ 100 million
Switch delay time	approx. 32 ms *(standard)* 8 to 2000ms to be specified by customer *(in 8ms steps)*
Environmental Condition	
Compensated temperature range	-13° to 185°F (-25° to 85°C)
Operating temperature range	-40° to 185°F (-40° to 85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)
Media temperature range	-40° to 212°F (-40° to 100°C)
CE mark	EN 61000-6-1 / 2 / 3 / 4
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 25g
Environmental protection	IP 67 or IP 69K *(depending on electrical connection)*
Electrical Specifications	
Supply voltage	8 to 32 VDC
Residual ripple suppy voltage	≤ 5%
Electrical connection	M12x1, 4-pole AMP DIN 72585 Baj., 3-pole Deutsch DT04-3P, 3-pole Deutsch DT04-4P, 4-pole AMP Superseal, 3-pole Packard Metri Pack Series 150, 3-pole AMP Junior Power Times, 3-pole 1 m open ended cable
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard

Dimensions



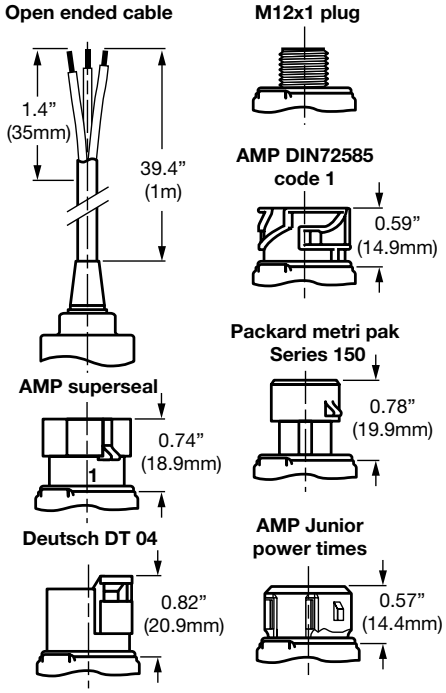


7/16-20UNF2A



9/16-18UNF2A

Plug Connection



Min of 25 pieces required

EDS 4100 ATEX Series

Factory Set Absolute Pressure Switch Intrinsically Safe with ATEX Approval

Applications

Description

The pressure switch EDS 4100 in ATEX version, has been specially developed for use in potentially explosive atmospheres, and is based on the EDS 4000 series.

The switching and switch-back point, the function of the switching outputs as N/C or N/O, and the switching delay are permanently pre-set according to customer specification.

As with the industry version, the EDS 4100 in ATEX version has a ceramic measurement cell with thick-film strain gauge for measuring absolute pressure in the low pressure range.

Special Features

- Switching output permanently pre-set
- Accuracy ≤ ±0.5% BFSL
- Certificates:
  DEKRA EXAM BVS 07 ATEX E 041 X
- Various types of electrical connection
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Technical Details

Sensor Specifications		
Measuring ranges - psi	15, 50	
Overload pressure - psi	45, 150	
Burst pressure - psi	70, 250	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)*	
Tightening torque	G1/4: 15 lb-ft (20 Nm) 1/4" NPT: 30 lb-ft (40 Nm)	
Parts in contact with media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 150 g	
Switching Specifications		
Type	1 PNP transistor output (N/O or N/C)	
Repeatability	≤ ±0.1% FS max at 25 °C	
Ouput load	During Operation: Imax ≤ 34 mA	
Set point / reset point	to be specified by customer	
Switching cycles	≥ 100 million	
Switch delay time	approx. 32 ms *(standard)* 8 to 2000ms to be specified by customer *(in 8ms steps)*	
Environmental Condition		
Compensated temperature range	T6: -4° to 140°F (-20° to 60°C) T4/T5: -4° to 158°F (-20° to 70°C) T100: -4° to 185°F (-20° to 85°C)	
Operating temperature range	T6: -4° to 140°F (-20° to 60°C) T4/T5: -4° to 158°F (-20° to 70°C) T100: -4° to 185°F (-20° to 85°C)	
Max. ambient temperature T_a	T6: 140°F (60°C) T4/T5: 158°F (70°C)	**II 1 D** T100: 185°F (85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)	
Media temperature range	-4° to 140°/158°/185°F (-20° to 60°/70°/85°C)	
CE mark	EN 61000-6-1 / 2 / 3 / 4, EN 60079-0/11/26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 65, IP 67 *(depending on electrical connection)*	
Electrical Specifications		
Supply voltage	14 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
	I M1 / II 1G, 1/2G, 2G	**II 1D**
Max input current	100 mA	93 mA
Max input power	0.7 W	0.65 W
Max internal capacitance	33 nF	33 nF
Max internal inductance	0 H	0 H
Isolation voltage	125 VAC to housing *(standard)*	
Approved safety barriers	Pepperl & Fuch: Z787 Telematic Ex STOCK: MTL 7087	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Approvals

ATEX Approvals

I M1 EEx ia
II 1G EEx ia IIC T6
II 1/2 G EEx ia IIC T6
II 2G EEx ia IIC T6
II 1D IP6X T80°C

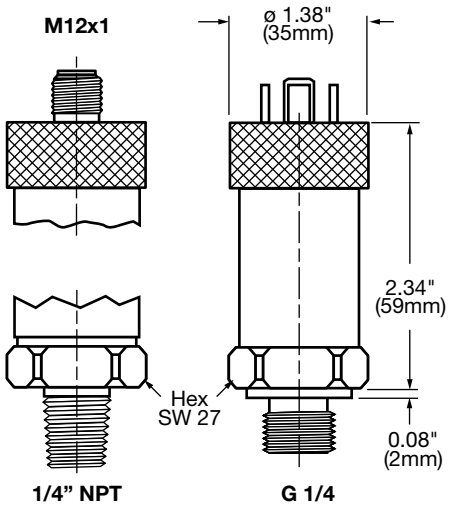
CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

Application Areas

Code Type Code	1	2	3	8
Protection class	I M1 EEx ia	II 1G EEx ia IIC T4, T5, T6	II 2G EEx ia IIC II 1/2G EEx ia IIC T4, T5, T6	II 1D Ex iaD 20 T100°C
Certificate number	DEKRA EXAM BVS 07 ATEX E 041 X			
Zones / Categories	Group I Category M 1 mining Protection type: intrinsically safe ia with barrier	Group II Category 1G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 0	Group II Category 2G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 1 & 2 Retrofit in: Zone 0	Group II Category iD Dust Protection type: intrinsically safe ia with barrier Use in: Zone 20, 21, 22 Enclosure provides no protection!
Temperature Range		T6: Tamb = 60°C T4, T5: Tamb = 70°C		T100: Tamb = 85°C
Electrical Connection *(see model code)*	5, 6	6	5, 6	6

Dimensions



Min of 25 pieces required

EDS 4300 ATEX Series

Low Pressure Switch
Intrinsically Safe with ATEX Approval

Applications

Description

The electronic pressure switch EDS 4300 in ATEX version, has been specially developed for use in potentially explosive atmospheres, and is based on the EDS 4000 series.

The switching and switch-back point, the function of the switching outputs as N/C or N/O, and the switching delay are permanently pre-set according to customer specification.

As with the industry version, the EDS 4300 in ATEX version has a ceramic measurement cell with thick film strain gauge for measuring relative pressure in the low pressure range.

Special Features

- Switching output permanently pre-set
- Accuracy ≤ ±0.5% BFSL
- Certificates:
  DEKRA EXAM BVS 07 ATEX E 041 X
- Various types of electrical connection
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

ATEX Approvals

I M1 EEx ia
II 1G EEx ia IIC T6
II 1/2 G EEx ia IIC T6
II 2G EEx ia IIC T6
II 1D IP6X T80°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

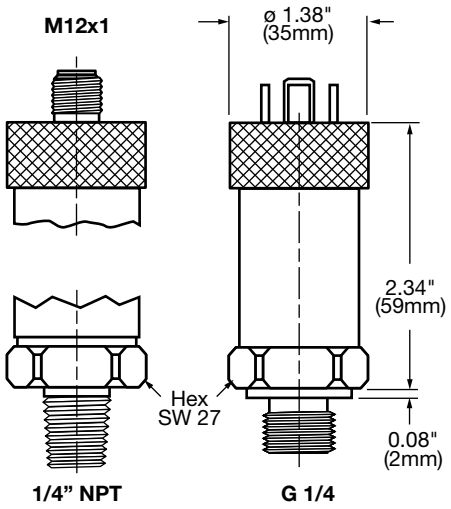
Technical Details

Sensor Specifications		
Measuring ranges - psi	15, 50, 100, 150, 250, 500	
Overload pressure - psi	45, 150, 290, 450, 725, 1500	
Burst pressure - psi	70, 250, 400, 650, 1000, 2500	
Mechanical connection	G1/4A DIN 3852 male *(bar ranges only)* 1/4"-18 NPT male *(psi ranges only)*	
Tightening torque	Approx. 15 lb-ft (20 Nm) *(G1/4A DIN 3852 only)* Approx. 30 lb-ft (40 Nm) *(1/4"-18 NPT only)*	
Parts in contact with media	Sensor: Ceramic Mechanical connection: Stainless steel Seal: FPM or EPDM	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 150 g	
Switching Specifications		
Type	1 PNP transistor output (N/O or N/C)	
Repeatability	≤ ±0.1% FS max at 25°C	
Ouput load	During Operation: Imax ≤ 34 mA	
Set point / reset point	to be specified by customer	
Switching cycles	≥ 100 million	
Switch delay time	approx. 32 ms *(standard)* 8 to 2000ms to be specified by customer *(in 8ms steps)*	
Environmental Condition		
Compensated temperature range	T6: -4° to 140°F (-20° to 60°C) T4/T5: -4° to 158°F (-20° to 70°C) T100: -4° to 185°F (-20° to 85°C)	
Operating temperature range	T6: -4° to 140°F (-20° to 60°C) T4/T5: -4° to 158°F (-20° to 70°C) T100: -4° to 185°F (-20° to 85°C)	
Max. ambient temperature T_a	T6: 140°F (60°C) T4/T5: 158°F (70°C)	**II 1 D** T100: 185°F (85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)	
Media temperature range	-4° to 140°/158°/185°F (-20° to 60°/70°/85°C)	
CE mark	EN 61000-6-1 / 2 / 3 / 4, EN 60079-0/11/26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 65, IP 67 *(depending on electrical connection)*	
Electrical Specifications		
Supply voltage	14 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
	I M1 / II 1G, 1/2G, 2G	**II 1D**
Max input current	100 mA	93 mA
Max input power	0.7 W	0.65 W
Max internal capacitance	33 nF	33 nF
Max internal inductance	0 H	0 H
Isolation voltage	125 VAC to housing *(standard)*	
Approved safety barriers	Peperl & Fuch: Z787 Telematic Ex STOCK: MTL 7087	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Application Areas

Code Type Code	1	2	3	8
Protection class	I M1 EEx ia	II 1G EEx ia IIC T4, T5, T6	II 2G EEx ia IIC II 1/2G EEx ia IIC T4, T5, T6	II 1D Ex iaD 20 T100°C
Certificate number	DEKRA EXAM BVS 07 ATEX E 041 X			
Zones / Categories	Group I Category M 1 mining Protection type: intrinsically safe ia with barrier	Group II Category 1G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 0	Group II Category 2G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 1 & 2 Retrofit in: Zone 0	Group II Category iD Dust Protection type: intrinsically safe ia with barrier Use in: Zone 20, 21, 22 Enclosure provides no protection!
Temperature Range		T6: Tamb = 60°C T4, T5: Tamb = 70°C		T100: Tamb = 70°C
Electrical Connection *(see model code)*	5, 6	6	5, 6	6

Dimensions



Min of 25 pieces required

EDS 4400 ATEX Series

High Pressure Switch
Intrinsically Safe with ATEX Approval

Applications

Description

The electronic pressure switch EDS 4400 in ATEX version, has been specially developed for use in potentially explosive atmospheres, and is based on the EDS 4000 series.

The switching and switch-back point, the function of the switching outputs as N/C or N/O, and the switching delay are permanently pre-set according to customer specification.

As with the industry version, the EDS 4400 in ATEX version has a stainless steel measurement cell with thin-film strain gauge for measuring relative pressure in the high pressure range.

Special Features

- Switching point and switch-back point permanently pre-set according to customer specification
- Accuracy ≤ ±0.5% BFSL
- Certificates:
  DEKRA EXAM BVS 07 ATEX E 041 X
- Various types of electrical connection
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

ATEX Approvals

I M1 EEx ia
II 1G EEx ia IIC T6
II 1/2 G EEx ia IIC T6
II 2G EEx ia IIC T6
II 1D IP6X T80°C

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Ex mark is a specific marking for explosive protection equipment

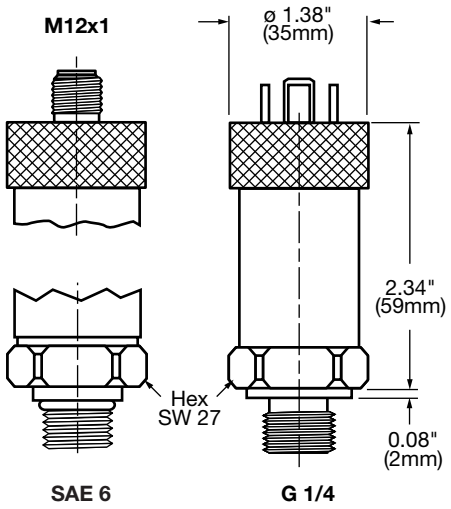
Technical Details

Sensor Specifications		
Measuring ranges - psi	500, 1000, 3000, 6000, 9000	
Overload pressure - psi	1160, 2900, 7250, 11600, 11600, 14500	
Burst pressure - psi	2900, 7250, 14500, 29000, 29000, 29000	
Mechanical connection	SAE 6 male *(standard psi ranges only)* G1/4A DIN 3852 male *(bar ranges only)*	
Tightening torque	15 lb-ft (20 Nm)	
Parts in contact with media	Sensor: Stainless steel 1.4542 Mechanical connection: Stainless steel 1.4542, 1.4301, 1.4435, 1.4571, 1.4404, 316L, 304 Seal: FPM (SAE 6, G1/4)	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.1% FS typ. / year	
Life expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 150 g	
Switching Specifications		
Type	1 PNP transistor output (N/O or N/C)	
Repeatability	≤ ±0.1% FS max at 25°C	
Ouput load	During Operation: Imax ≤ 34 mA	
Set point / reset point	to be specified by customer	
Switching cycles	≥ 100 million	
Switch delay time	approx. 32 ms *(standard)* 8 to 2000ms to be specified by cust. *(in 8ms steps)*	
Reaction time	< 10 ms	
Environmental Condition		
Compensated temperature range	T6: -4° to 140°F (-20° to 60°C) T4/T5: -4° to 158°F (-20° to 70°C) T100: -4° to 185°F (-20° to 85°C)	
Operating temperature range	T6: -4° to 140°F (-20° to 60°C) T4/T5: -4° to 158°F (-20° to 70°C) T100: -4° to 185°F (-20° to 85°C)	
Max. ambient temperature T_a	T6: 140°F (60°C) T4/T5: 158°F (70°C)	**II 1 D** T100: 185°F (85°C)
Storage temperature range	-40° to 212°F (-40° to 100°C)	
Media temperature range	-4° to 140°/158°/185°F (-20° to 60°/70°/85°C)	
CE mark	EN 61000-6-1 / 2 / 3 / 4, EN 60079-0/11/26, IEC 61241-11	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental protection	IP 65, IP 67 *(depending on electrical connection)*	
Electrical Specifications		
Supply voltage	14 to 28 VDC	
Residual ripple suppy voltage	≤ 5%	
	I M1 / II 1G, 1/2G, 2G	**II 1D**
Max input current	100 mA	93 mA
Max input power	0.7 W	0.65 W
Max internal capacitance	33 nF	33 nF
Max internal inductance	0 H	0 H
Isolation voltage	125 VAC to housing *(standard)*	
Approved safety barriers	Pepperl & Fuch: Z787 Telematic Ex STOCK: MTL 7087	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

Application Areas

Code Type Code	1	2	3	8
Protection class	I M1 EEx ia	II 1G EEx ia IIC T4, T5, T6	II 2G EEx ia IIC II 1/2G EEx ia IIC T4, T5, T6	II 1D Ex iaD 20 T100°C
Certificate number	DEKRA EXAM BVS 07 ATEX E 041 X			
Zones / Categories	Group I Category M 1 mining Protection type: intrinsically safe ia with barrier	Group II Category 1G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 0	Group II Category 2G, 1/2G Gases Protection type: intrinsically safe ia with barrier Use in: Zone 1 & 2 Retrofit in: Zone 0	Group II Category iD Dust Protection type: intrinsically safe ia with barrier Use in: Zone 20, 21, 22 Enclosure provides no protection!
Temperature Range		T6: Tamb = 60°C T4, T5: Tamb = 70°C		T100: Tamb = 85°C
Electrical Connection *(see model code)*	5, 6	6	5, 6	6

Dimensions



Min of 25 pieces required

EDS 4000 Series

Factory Set Pressure Switch CSA Explosion Proof, ATEX & IECEx Explosion & Flame Proof

Applications

Description

The EDS 4000 series electronic pressure switch with triple approval *($_{c}$CSA$_{us}$, ATEX Exd, IECExd)* allows installtion world wide in any hazardous environment. This also optimizes spare part stock and prevents technicians to apply the wrong pressure switch to their systems.

The switch is using our highly reliable and proven thin film pressure sensor which is welded to the connection so no internal seal is required. All welded parts as well as the housing is made out of industrial standard stainless steels toprevent corrosion. The triple approval is also available with NACE compliant materials.

The main areas of applications for this pressure switch are oil and gas *(BOP's, top drives, turn tables, control panels)* and mining *(underground vehicles, hydraulic drives)* as well as other hazardous areas.

Special Features

- Accuracy ≤ ±0.5% BFSL
- Option of PNP or NPN switching outputs
- High switching output capacity
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term characteristics

Approvals

$_{c}$CSA$_{us}$ Explosion Proof *(Seal Not Required)*
Class I Group A, B, C, D
Class II Group E, F, G
Class III
Type 4

ATEX Flame Proof
I M2 Ex d I
II 2G Ex d IIC T6, T5

IECEx Flame Proof
Ex d I Mb
Ex d IIC T6, T5 Gb

Technical Details,

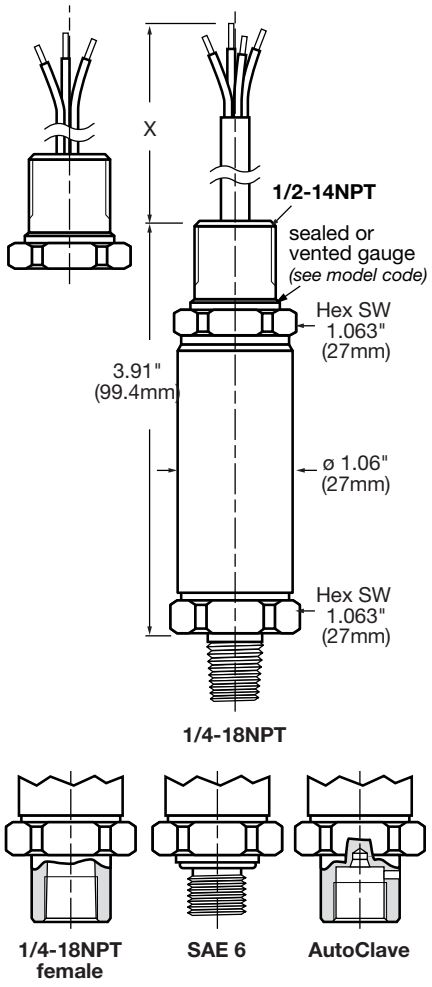
Sensor Specifications		
Measuring Ranges - psi	100, 300, 500, 1000, 1500, 3000, 5000, 6000, 9000, 10000, 15000	
Overload Pressure - psi	290, 1160, 1160, 2900, 2900, 7250, 11600, 11600, 14500, 14500, 23200	
Burst Pressure - psi	1450, 2900, 2900, 7250, 7250, 14500, 29000, 29000, 29000, 29000, 43500	
Mechanical Connection	1/4"-18 NPT, male 1/4"-18 NPT, female SAE 6 9/16-UNF 2A G1/4A DIN 3852 *(bar ranges only)* SF 250 CX20, Autoclave (7/16-20 UNF 2B)	
Tightening Torque	Approx. 15 lb-ft (20 Nm) Approx. 30 lb-ft (40 Nm) *(1/4"-18 NPT only)*	
Parts in Contact with Media	1.4542, 1.4301, 304, 630	
Housing material	1.4435, 1.4404, 316L	
Accuracy (B.F.S.L.) including linearity, hysteresis, and repeatability	≤ ±0.5% BFSL.	
Temperature compensation zero point	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Temperature compensation over range	≤ ±0.0085% / °F typ.	≤ ±0.017% / °F max.
Long-term drift	≤ ±0.3% FS typ. / year	
Life Expectancy	10 million load cycles (0 to 100% FS)	
Weight	Approximately 280 g	
Switching Specifications		
Type	1 or 2 PNP outputs *(NPN upon request)*	
Repeatability	≤ ±0.1% FS max.	
Switching Current	1 Switching ouput 2 Switching outputs	1.2A 1.0A each
Set Point	to be specified by customer	
Reset Point	to be specified by customer	
Switch delay time	approx. 32 ms (standard) 8 to 2000ms to be specified by customer *(in 8ms steps)*	
Switching Cycles	≥ 100 million	
Environmental Condition		
Compensated temperature range	T5: -13° to 176°F (-25° to 80°C) T6: -13° to 140°F (-25° to 60°C)	
Operating temperature range[1)]	T5: -40° to 176°F (-25° to 80°C) T6: -40° to 140°F (-40° to 60°C)	
Storage temperature range	-40° to 212°F (-40° to 100°C)	
Media temperature range[1)]	-40° to 212°F (-40° to 100°C) -4° to 212°F (-20° to 100°C) with FPM	
CE mark	EN 61000-6-1 / 2 / 3 / 4, IEC 600079-0 / 1	
Vibration resistance to DIN EN 60068-2-6 at 10 to 500 Hz	≤ 20g	
Environmental Protection	IP 65 *(vented gauge)* / IP 69K *(sealed gauge)*	
Electrical Specifications		
Supply voltage	12 to 30 VDC	
Residual ripple suppy voltage	≤ 5%	
Current consumption	approximately 25 mA *(inactive switching output)*	
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard	

1) With SAE or G1/4, in combination with FPM seal -4°F (-20°C)

Application Areas

Protection class	$_{C}CSA_{US}$	Explosion Proof Seal Not Required	
	ATEX	Flame Proof	
	IECEx	Flame Proof	
Certificate number	ATEX KEMA 10ATEX0100 X CSA MC 224264 IECEx KEM 10.0053X		
Zones / Categories	$_{C}CSA_{US}$	Class I Class II Class III Type 4	Group A, B, C, D Group E, F, G
	ATEX	I M2 II 2G	Ex d I Ex d IIC T6, T5
	IECEx	Ex d I Mb Ex d IIC T6, T5 Gb	
Electrical Connection *(see model code)*	9; G		

Dimensions



1620 Series
TestPoints

Applications

- Pressure measurement with gauges or sensors
- Fluid sampling
- Air bleeding

Description

HYDAC series 1620, guided piston design, TestPoints are compact, self sealing couplings that provide access to hydraulic and pneumatic systems for pressure measurement to 9000 psi. Mating adapters or hose connections can be connected without loss of fluid while the system is operating. TestPoints can also be used to take oil samples or to bleed air from hydraulic systems. They are available in 1620 (M16x2.0) connection threads with a variety of screw-in port configurations.

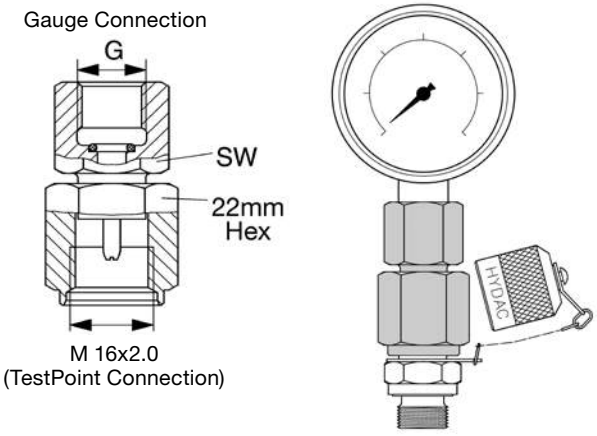
Technical Details

Specifications	
Max. Rated Pressure	9000 psi (630 bar)
Fluid Compatibility	Petroleum based fluids Gaseous media
Materials	Zinc plated steel body *(standard)* Zinc plated metal cap *(standard)*
Seals	Buna-N *(standard)* Viton *(optional)*
Temperature with metal cap and Buna-N seals:	-22°F to 248°F (-30°C to 120°C)
Options	Anti-vibration seal for metal cap

Features

- Can be coupled and uncoupled under pressure without system shutdown or fluid loss
- Patented guided piston design for leak free performance at operating pressure to 9000 psi
- HYDAC guided piston design provides the following advantages over ball seal design:
  - Higher working Pressure
  - Better sealing characteristics particularly under high vibration
  - Less susceptible to fluid contamination
  - Can be used for gases as well as fluid

1620 Series Adapters
Direct Gauge Adapter

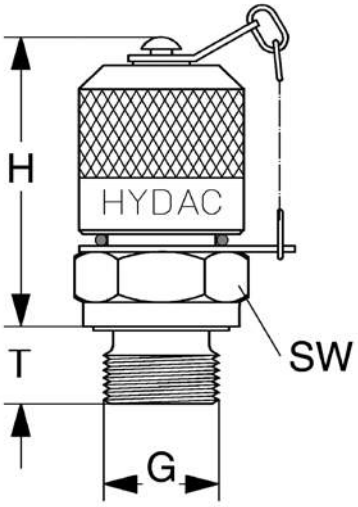


Thread G	Pmax	SW	Part No.
ISO 228-G 1/4	9000 psi (630 bar)	19	06003824
ISO 228-G 1/2	*9000 psi (630 bar)*	*27*	*06003825*
1/4 NPT	9000 psi (630 bar)	19	06003769

Part numbers listed in RED italics are non-standard items - Minimum quantities may apply - Contact HYDAC for information and availability

Dimensions

Standard 1620 TestPoint connection with cap



Select desired connection in chart to the right

Carbon Steel TestPoints *(Zinc-Plated, Buna N Seals)*

Thread G	Pmax	H (mm)	T (mm)	SW (mm)	Part No.
1/8 NPTF	5800 psi (400 bar)	33	13	17	06003734
1/4 NPTF	5800 psi (400 bar)	33	16.5	17	00639645
7/16-20 UNF	9000 psi (630 bar)	37	9	17	06003735
9/16-18 UNF	9000 psi (630 bar)	36	10	19	06003737
M 8x1	3600 psi (250 bar)	41	8.5	17	06003731
M 10x1	3600 psi (250 bar)	37.5	8.5	17	00629237
M 12x1.5	9000 psi (630 bar)	36	10	17	00632615
M 14x1.5	9000 psi (630 bar)	36	10	19	00632248
M 16x1.5	9000 psi (630 bar)	36	10	22	06003732
ISO 228-G 1/8	5800 psi (400 bar)	38	8	17	00689901
ISO 228-G 1/4	9000 psi (630 bar)	36	10	19	00680107
ISO 228-G 3/8	9000 psi (630 bar)	36	10	22	06003733
ISO 7/I-R 1/8	5800 psi (400 bar)	33	13	17	06003738
ISO 7/I-R 1/4	9000 psi (630 bar)	33	13	17	06003739

Carbon Steel TestPoints *(Zinc-Plated, Fluorelastomer Seals)*

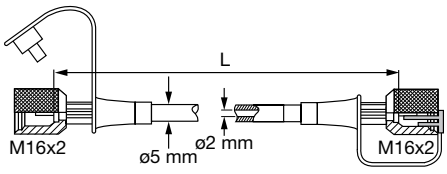
Thread G	Pmax	H (mm)	T (mm)	SW (mm)	Part No.
1/8 NPTF	5800 psi (400 bar)	33	13	17	06007199
1/4 NPTF	5800 psi (400 bar)	33	13	17	06007200
7/16-20 UNF	9000 psi (630 bar)	37	9	17	06007029
9/16-18 UNF	9000 psi (630 bar)	36	10	19	06007030
ISO 228-G 1/4	9000 psi (630 bar)	36	10	19	00606304

Stainless Steel TestPoints *(Fluorelastomer Seals)*

Thread G	Pmax	H (mm)	T (mm)	SW (mm)	Part No.
1/4 NPTF	5800 psi (400 bar)	33	13	17	02701487
7/16-20 UNF	5800 psi (400 bar)	33	16.5	17	02701486

Dimensions are for general information only, all critical dimensions should be verified by requesting a certified print.
* for port configuration drawings contact HYDAC.

Micro Bore Flexible Hoses



L (inches)	L (mm)	Part No.
8	200	06003723
12	300	06003724
16	400	00632633
20	500	06003725
25	630	06003726
31	800	00682857
39	1000	00632634
49	1250	06003727
59	1500	00682858
79	2000	00682859
98	2500	00682860
126	3200	06003728
157	4000	06003729
197	5000	06003730

Specifications

- Maximum working pressure 9000 psi (630 bar) at 122˚F (50°C)
  (see pressure utilization factor to adjust for higher temperatures)
- Suitable for petroleum based fluids
- Temperature range -4° to 122°F (-20° to 50°C)
- Polyamid core with polyester braid reinforcement and polyamid jacket
- Plastic dust cap
- 1620 female connection at both ends
- Bending radius: min. 20mm
- Hose ID ø 2mm
- Custom Hose Assemblies Available:
  NPT Male Thread, NPT Female Thread, JIC Male Hose, JIC Female swivel hose ends

Pressure Utilization Factor for Hoses

Operating Temp.	Factor	Max. Pressure
122°F (50°C)	100%	9000 psi (630 bar)
176°F (80°C)	86%	7740 psi (534 bar)
212°F (100°C)	77%	6930 psi (478 bar)

Part numbers listed in RED italics are non-standard items - Minimum quantities may apply - Contact HYDAC for information and availability

TFP 100 Series
Temperature Probe

Applications

Description

The temperature probe TFP 100 was developed mainly for tank mounting. The PT 100 precision resister in 4-conductor design can be connected directly to HYDAC temperature switches EDS 3800, ETS 380 and ETS 1700.

The standardised electrical connection also means that other evaluation or control systems *(e.g. PLC)* can easily be connected.

For adaptation to different applications and fluids, a nickel plated brass mounting sleeve which is pressure resistant up to 145 psi (10 bar) is also available as an accessory.

Technical Details,

Temperature probe TFP 100	
Fluid temperature range	-40° to 257°F (-40° to 125°C)
Electrical connection	Male Binder series 714 M18, 4 pole M12x1, 4 pole
Parts in contact with fluid	Brass
CE mark	EN 61000-6-1 / 2 / 3 / 4
Supply voltage	9 to 35 VDC
Protective Sleev for Tank Mounting the TFP (Accessory, not supplied as standard)	
Pressure resistance	145 psi (10 bar)
Parts in contact with fluid	CuZn39Pb3 (brass), nickel plated

Special Features

- Measurement circuit configured as four-conductor circuit
- Simple to install
- For universal applications

Approvals

CE mark is a mandatory conformity mark on many products placed on the single market in the European Economic Area

Model Code

TFP 10 X - 000

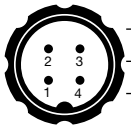
Separate Temperature Probe

Electrical Connection
4 = 4 pole Binder series 714 M18 *(connector supplied)*
6 = 4 pole M12x1 *(connector not supplied)*

Modification Number
000 = Standard

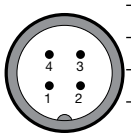
Pin Connection

Binder 714 M18



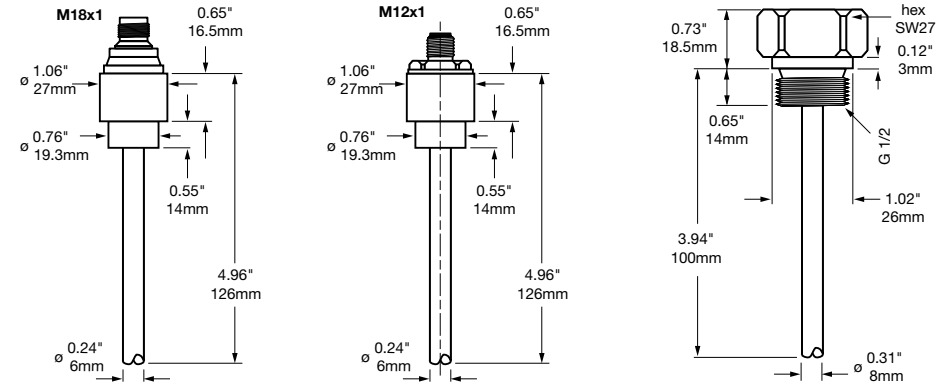
Pin	
1	+Supply
2	+ Signal
3	- Signal
4	- Supply

M12x1, 4 pole



Pin	
1	+Supply
2	+ Signal
3	- Signal
4	- Supply

Dimensions



ZBM 3200 Protective Cover

Part # 03201919

For use with EDS, ETS and ENS 3000 series products.
Designed to provide additional protection in harsh environments.

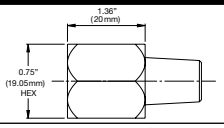
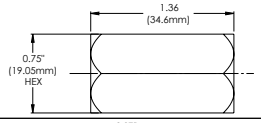
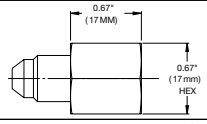
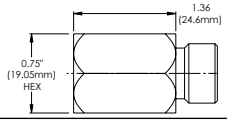
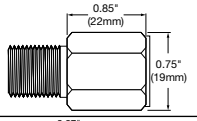
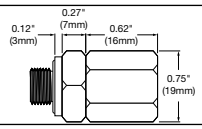
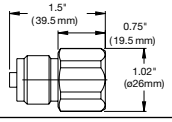
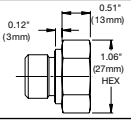
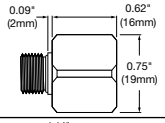
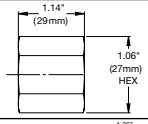
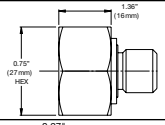
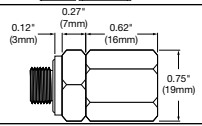
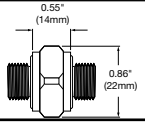


Mounting Kits

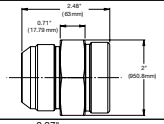
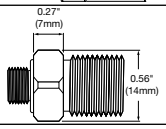
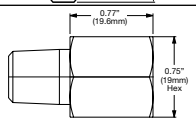
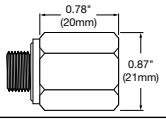
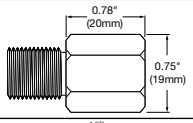
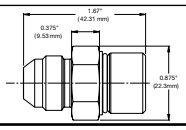
Photo	Description	Part No.
	EDS 1600/1700 and ETS 1600/1700	00257492
	ZBM 300 Wall Mounting Clamp for EDS/ETS 300	00906385
	ZBM 310 Wall Mounting Clamp for EDS/ETS 3000	06011511
	Clamping Kit	00435812

Photo	Description	Part No.
	ZBM 3000 Screw Version Mounting Clamp	03184630
	ZBM 3100 Weld Version Mounting Clamp	03184632
	EDS 601 Mounting Clamp	00905404

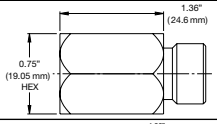
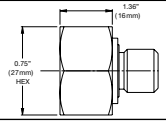
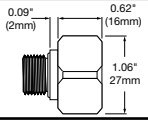
Mechanical Adapters

A Connection	B Connection	Model Code Description	Part No.	Dimenions
G 1/4 (F)	1/4” NPT (M)	Adapter G 1/4 (F) to 1/4” NPT (M) stainless steel	02701407	
G 1/4 (F)	G 1/4 (F)	Adapter G 1/4 (F) to G 1/4 (F)	02063435	
G 1/4 (F)	SAE-4 (M) JIC37	Adapter G 1/4 (F) to SAE-4 (M) JIC 37	02700841	
G 1/4 (F)	SAE-6 (M)	Adapter G 1/4 (F) to SAE-6 (M)	02055566	
G 1/4 (F)	1/4” NPT (M)	Adapter G 1/4 (F) to 1/4” NPT (M) Stainless Steel	02055899	
G 1/4 (F)	G 1/4 (M)	Aligning adapter for EDS 300	02700947	
G 1/4 (F)	G 1/2 (M)	ZBM 01 DIN 16288	00257276	
G 1/4 (F)	G 1/2 (M)	ZBM 02 DIN 3852	00257277	
G 1/4 (F)	G 1/4 (M) w/ 0.3mm (Snubber)	ZBM 09	00907367	
G 1/4 (F)	G 1/2 (F)	ZBM 10	00257764	
G 1/4 (F)	G 1/4 (M) w/ 0.5mm (Snubber)	ZBM 13	00906968	
G 1/4 (F)	G 1/4 (M)	ZBM 14	00907818	
G 1/4 (M)	G 1/4 (M)	ZBM 03	00257163	

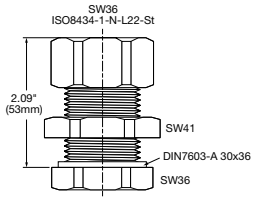
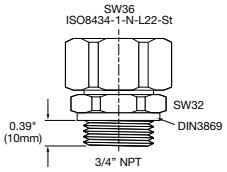
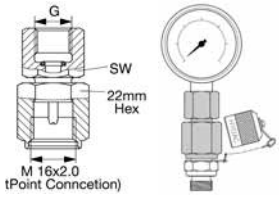
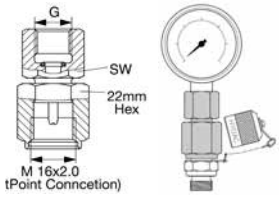
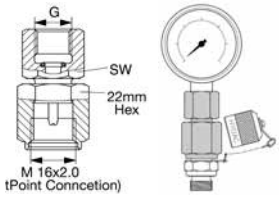
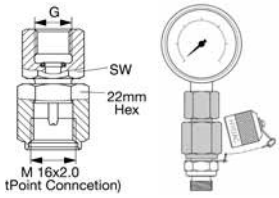
Mechanical Adapters cont.

A Connection	B Connection	Model Code Description	Part No.	Dimenions
SAE-24 37°	M1 1/2 BSPP (M)	Adapter SAE-24 37° to M1 1/2 BSPP (M)	02700542	
SAE-4 (M)	1/4” NPT (M)	Adapter SAE-4 (M) to 1/4” NPT (M)	02701426	
SAE-6 (F)	1/4 NPT (M)	Adapter SAE-6 (F) to 1/4 NPT (M)	02701430	
SAE-6 (F)	G 1/4 (M)	Adapter SAE-6 (F) to G 1/4 (M)	02701429	
SAE-6 (F)	1/4 NPT (M)	Adapter SAE-6 (F) to 1/4 NPT (M)	02701673	
SAE-8 (M) 37°	G 1/2 (M)	Adapter SAE-8 (M) 37° to G 1/2 (M)	02700541	

Snubber Adapters

A Connection	B Connection	Model Code Description	Part No.	Dimensions
G 1/4 (F)	SAE-6 (M)	Snubber 0.5mm	02067166	
G 1/4 (F)	G 1/4 (M)	ZBM 13 0.5mm Snubber	00906968	
SAE-6 (F)	SAE-6 (M)	ZBM 15 0.5mm Snubber	00907750	

Mechanical Adapters

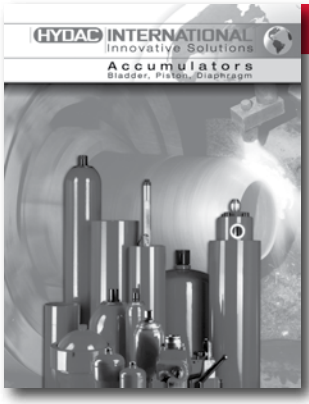
A Connection	B Connection	Model Code Description	Part No.	Dimensions
G 3/4" BSPP		ZBM 19 ENS 3000 Install Kit (G 3/4 BSPP) (Bulkhead)	00908738	
G 3/4 BSPP		ZBM 20 ENS 3000 Adapter (G 3/4 BSPP)	00908739	
M16x2.0	1/4 NPT	Testpoint Direct Gauge Adapter 1620 (1/4 NPT)	06003769	
M16x2.0	SAE-4	Testpoint Direct Gauge Adapter 1620 (7/16-20 UNF)	02083643	
M16x2.0	G 1/4	Testpoint Direct Gauge Adapter 1620 (G 1/4)	06003824	
M16x2.0	G 1/2	Testpoint Direct Gauge Adapter 1620 (G 1/2)	06003825	

Electrical Connectors

Photo	Part Number	Description
	00905701	ZBE 01 Hirschmann DIN 43650 90°
	02701774	ZBE 01 Hirschmann 180° w/ 3' Molded Cable
	02072888	ZBE 02 Binder M18 w/ 15' cable
	00609479	ZBE 02 4 Pole M18 180°
	02082471	ZBE 02 M18 w/ 15' cable *(modified)*
	02072889	ZBE 03 Binder M18 90° w/ 15' cable
	00609480	ZBE 03 4 Pole M18 90°
	02082472	ZBE 03 M18 w/ 15' cable *(modified)*
	00258011	ZBE 04 Hirschmann DIN 43650 to Binder M18
	02701462	ZBE 06 4 Pole M12 large dia w/o cable
	02701484	ZBE 06 180° M12 4-pole quick
	06006788	ZBE 06 90° M12 4 Pole
	02701196	ZBE 06-02-4 4 Pole M12 90° w/ 6' cable
	02701197	ZBE 06-05-4 4 Pole M12 90° w/ 15' cable

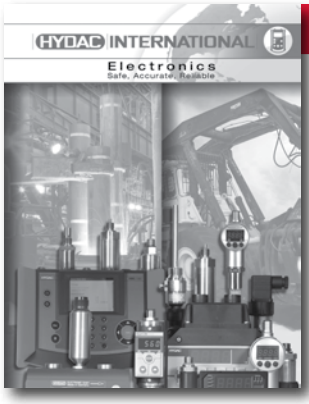
Photo	Part Number	Description
	02701775	ZBE 08 5 Pole M12 large dia w/o cable
	06006786	ZBE 08 5 Pole M12 90°
	06006792	ZBE 08-02 5 Pole M12 w/ 6' cable
	06006791	ZBE 08-05 5 Pole M12 w/ 15' cable
	06023102	ZBE 08-S-10 5 Pole M12, shielded cable
	00654527	ZBE 10 Binder M18
	00909695	ZBE 25 Reset Adapter
	06040851	ZBE 30-02 M12x1 w/ 6' cable for HMG
	06040852	ZBE 30-05 M12x1 w/ 15' cable for HMG
	03236597	ZBE 34 M12/Binder M18 for HMG
	03236601	ZBE 35 M12/Hirschmann DIN 43650 for HMG
	00909737	ZBE 36 HMG 3000 - AS 1000
	03224436	ZBE 38 Y-adaptor for HMG 3000

Accumulators



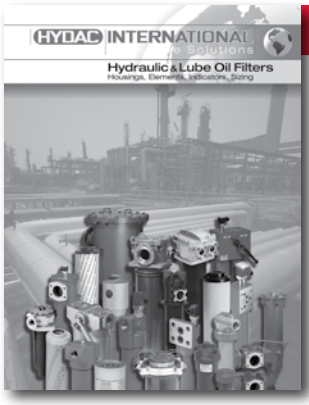
- Bladder Accumulators
- Diaphragm Accumulators
- Piston Accumulators
- Nitrogen Bottles
- Pulsation Dampeners
- Thermal Fuse Caps
- Safety & Shut-off Blocks
- Charging & Gauging Units
- Permanent Gauging Blocks
- Mounting Components
- Sizing Information
- Spare Parts, Seal Kits & Tools

Electronics



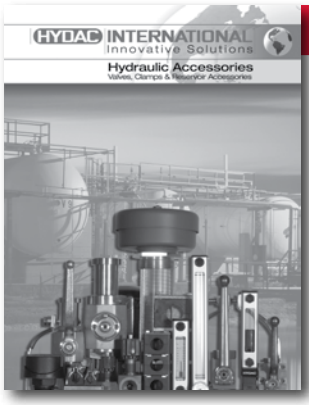
- Pressure Transducers
- Special Environment Transducers
- Pressure Switches
- Display Units
- Temperature Transducers
- Temperature Switches
- Level Sensors
- Flow Sensors
- Diagnostic Equipment
- Adapters
- Connectors
- Mounting Kits
- Demonstration Kits

Hydraulic & Lube Oil Filters



- Inline Filters
- Inline Duplex Filters
- In-Tank Filters
- In-Tank Inline Duplex Filters
- In-Tank Return Line Filters
- In-Tank Suction Filters
- Inside Tank Filters
- Manifold Mount Filters
- Modular Stacking Filters
- Manifold Cartridge Filters
- Low, Med. & High Press. Filters
- Filter Elements
- Clogging Indicators

Hydraulic Accessories



Valves
- High & Low Press. Ball Valves
- Flow Control Valves
- Hose Break Valves
- Metric Cartridge Valves

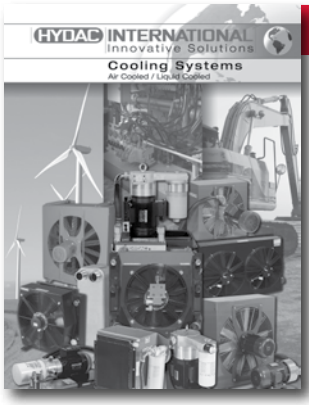
Clamps
- DIN 3015 Clamps
- Standard Clamps
- Custom Solutions

Accessories
- Breathers & Filler Breathers
- Fluid Level Indicators
- Suction Strainers
- Gauge Isolators
- TestPoints

Cartridge Valves & Manifolds

- Pressure Control Valves
- Pressure Relief Valves
- Pressure Reducing/ Relieving Valves
- Flow Control & Regulator Valves
- Check Valves
- Counterbalance Valves
- Solenoid Control Valves
- Directional Control Valves
- Proportional Valves
- Solenoid Coils
- Line Bodies & Form Tools
- Manifold Accessories
- Seal Kits & Adjustment Kits

Cooling Systems

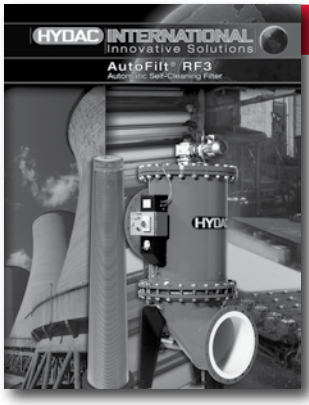


- Air Cooled Oil Coolers
- Air Cooling Systems for Water Glycol
- Air Cooled Oil Coolers for Mobile Applications
- Pump/Filter/Cooler Units
- Heat Exchangers
- Accessories
  - Adjustable Temperature Switches
  - Thermostatic Bypasses
  - Integrated Bypasses
  - Compatible Filters
  - Compatible Clogging Indicators

Mobile Hydraulics

- Sectional & Monoblock Configurations
- Manual, Hydraulic Pilot, Electro Hydraulic, Pneumatic Actuators
- Nominal flow - 14 to 42 gpm
- Maximum Pressure 5000 psi
- Special configurations to help you control fixed or variable displacement pumps
- Custom solutions in a single all-inclusive package
- Special adapted spool configurations according to your needs

Process Filtration



The AutoFilt® RF3 is an automatic self-cleaning filtration system designed for continuous maintenance free filtration of water.

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- 25 - 3000 micron ratings
- 25 to 150 psi operating pressures
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- Electric, Pneumatic, or
- Electro-pneumatic power source

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