



WINDPOWER

Pressure Transmitters TK

- Industrial automation
- Compressors
- Oil gear boxes
- Mobile hydraulics
- Earth moving machines
- Pumps
- Material testing machines



TK transmitters are based on the extensimetric thick film measuring principle. Thanks to highly stable electronic components, these transmitters can be used in applications requiring long-distance signal transmission or in smart control systems. TK pressure transmitters are designed mainly to measure pressure in oil, air, and hydraulic circuits. They can also be used in the technical and process measurement application as well as for compressors, presses and mobile hydraulic.

	VOLTAGE	CURRENT
Output signal		
Accuracy (1)	H $\pm 0.25\%$ FSO typical ($\pm 0.3\%$ FSO max) M $\pm 0.5\%$ FSO typical ($\pm 0.6\%$ FSO max)	
Measurement range	from 0...3 bar to 0...500 bar; from -1...+1 bar to -1...+10bar	
Resolution	Infinite	
Overpressure (without degrading performance) (2)	See table	
Pressure containment (burst test) (3)	See table	
Pressure Media	Fluid compatible with Inox 17-4 PH/AISI 430F	
Body materials	Inox AISI 304, nylon 66F35VO	
Power supply	B/M/P/R 10...30Vdc C/N/Q 15...30Vdc	10...30Vdc
Supply Sensitivity	< 0.0015% FSO/V	
Output noise (RMS 10-400Hz)	< 0.05% FSO	
Insulation resistance	> 1000 M Ω @ 50Vdc	
Zero output signal	B, C, M, N, P, Q, R	4mA (E)
Full scale output signal	B, C, M, N, P, Q, R	20mA (E)
Max current absorption	13mA	32mA
Max allowed load	1mA	See diagram
Long term stability	< 0.2% FSO/per year	
Operating temperature range (process)	-40...+105°C (-40...+221°F)	
Compensated temperature range	-10...+85°C (+14...+185°F)	
Storage temperature range	-40...+125°C (-40...+257°F)	
Temperature effects over compensated range (zero-span)	$\pm 0.012\%$ FSO/°C typical ($\pm 0.02\%$ FSO/°C max.)	
Response time (10...90%FSO)	< 1 msec.	
Start-up time	< 500 msec.	
Mounting position effects	Negligible	
Humidity	Up to 100%RH non-condensing	
Weight	110 gr. nominal	
Mechanical shock	100g/1ms according to IEC 68-2-6	
Vibrations	20g max at 15-2000Hz according to IEC 68-2-6	
Ingress protection	sealed to IP65/IP66/IP67	
Output short circuit and reverse polarity protection	YES	
Voltage spike protection	> 2kV burst test, to EN61000-4-4	
CE conformity (89/336 Directive)	EMC Emissions EN61000-6-3	

FSO = Full Scale Output

1 BFSL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability

2 tested for more than 1000 strokes with single duration < 2msec.

3 tested for more than 100 strokes with single duration < 2msec.

MEASUREMENT RANGE (Bar)	-1/+1	-1/+2	-1/+3	-1/+5	-1/+10	3	4	5	6	7	10	16	20	25	30	40	50	60	100	160	200	250	350	400	500
Overpressure	2	4	6	10	20	6	8	10	12	14	20	32	40	50	60	80	100	120	200	320	400	500	700	800	1000
Burst test	12	12	12	20	40	12	16	20	24	28	40	64	80	100	120	160	200	240	400	640	800	1000	1200	1200	1200



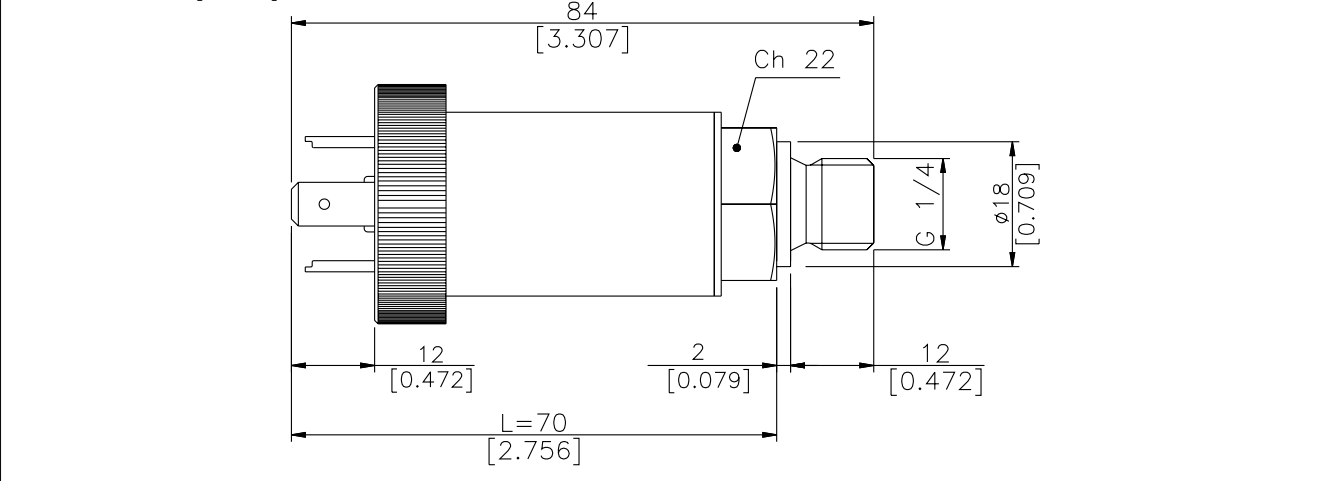
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DK-7100 Vejle | Fax +45 75 85 75 35 | www.ls-windpower.com



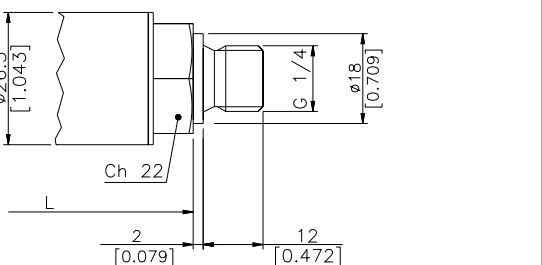
INSTALLATION DRAWINGS

Dimensions: mm [inches]

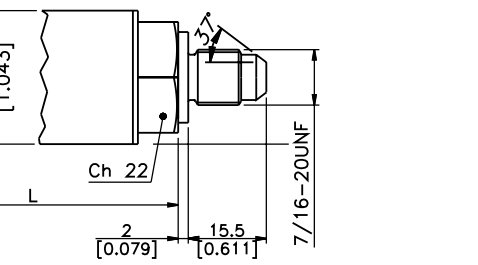


PRESSURE CONNECTION

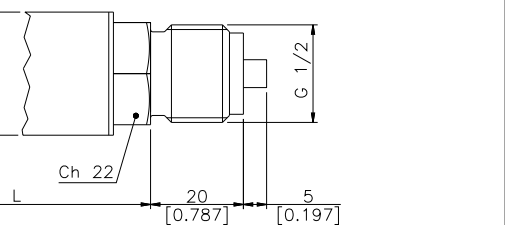
(1) G 1/4 MALE (DIN 3852-A)



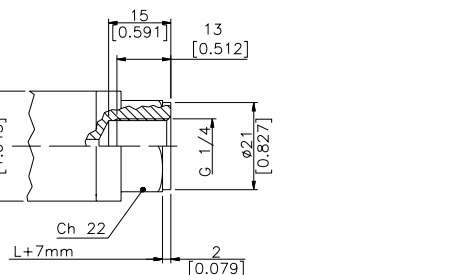
(2) SAE 04 AS4395 - E



(3) G 1/2 A (DIN 16288)

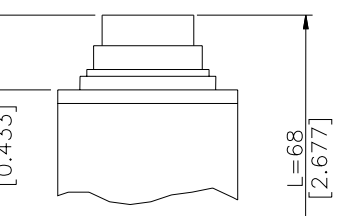


(4) G 1/4 FEMALE

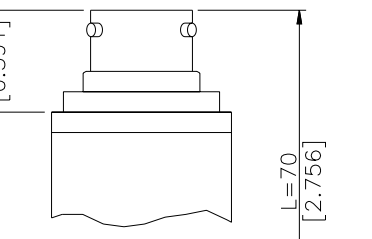


ELECTRICAL CONNECTION

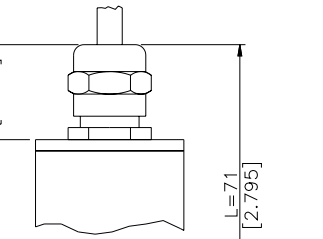
P - 7 pole connector



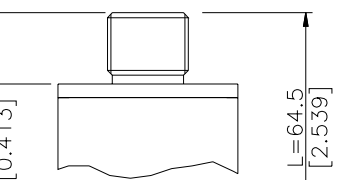
V - 6 pole connector



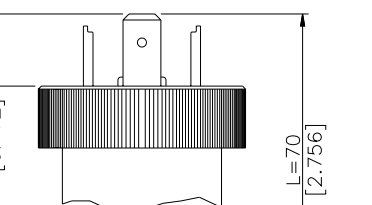
F - 4 pole cable



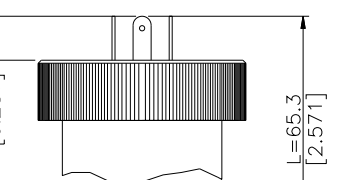
Z - 4 pole connector
M12 x 1



**E - 4 pole connector
solenoid**

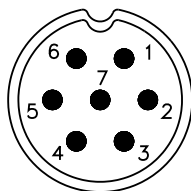


**M - 4 pole connector
microsolenoid**



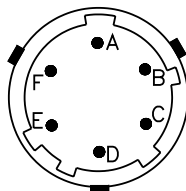
ELECTRICAL CONNECTION - Connectors

P - 7-pole connector



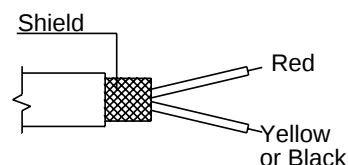
Male connector 09-127-09-07
Protection IP67

V - 6-pole connector



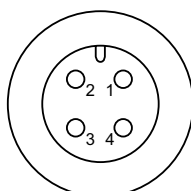
Male connector VPT02A10-6PT2
Protection IP66

F - 2 pole cable



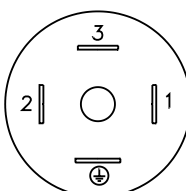
Shielded cable 2x0.25 - 2m. (output E)
Protection IP65

Z - 4-pole male connector M12 x 1



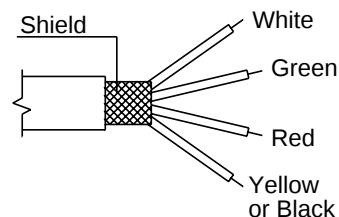
4 pole series 713 male connector
Protection IP67

E - 4 pole solenoid connector M - 4 pole microsolenoid connector



Solenoid DIN 43650A - ISO4400
Protection IP65
Microsolenoid DIN 43650C - ISO4400
Protection IP65

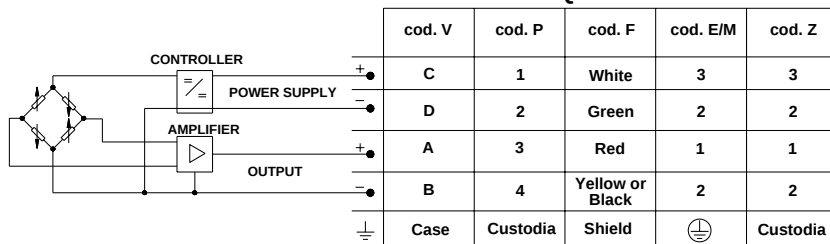
F - 4 pole cable



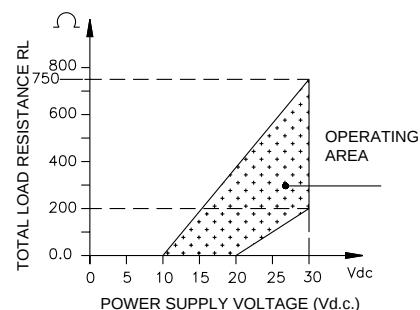
Shielded cable 4x0.25 - 2m
Protection IP65

ELECTRICAL CONNECTION - connection diagrams

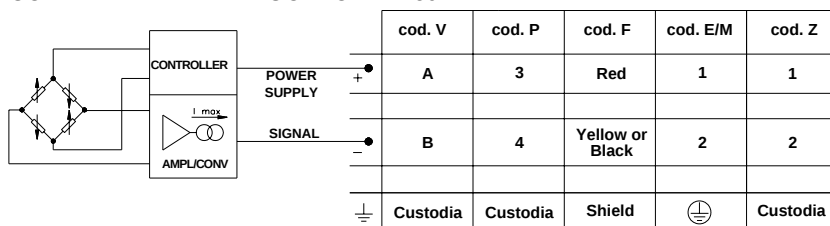
VOLTAGE AMPLIFIED OUTPUT - mod. B/C/M/N/P/Q/R



LOAD DIAGRAM (Current output)



CURRENT AMPLIFIED OUTPUT - mod. E



ACCESSORIES ON REQUEST

Connectors Plugs

Connection E

3 poles connector + ground DIN43650A ISO4400 **CON 006**
Prot. IP65

Connection Z

4 poles connector **CON 293**
Prot. IP67

Connection M

3 poles connector + ground DIN43650C ISO4400 **CON 008**
Prot. IP65

Connection P

7 poles female cable connector Prot. IP67 **CON 321**

Connection V

6 poles female cable connector Prot. IP66 **CON 300**

EXTENSION CABLES

6-pin connector with 8m (25ft) cable
6-pin connector with 15m (50ft) cable
6-pin connector with 30m (100ft) cable
Other lengths

C08WLS
C15WLS
C30WLS
consult factory

Cable color code	
Conn.	wire
A	Red
B	Yellow/Black
C	White
D	Green
E	Blue
F	Orange

ORDERING INFORMATION

Pressure transmitter

TK

OUTPUT SIGNAL		
Standard		
0,1 ... 10,1 Vdc		C
4...20 mA		E
0...10 Vdc		N
On request		
0,1 ... 5,1 Vdc		B
0 ... 5 Vdc		M
1 ... 5 Vdc		P
1 ... 10 Vdc		Q
1 ... 6 Vdc		R

PRESSURE CONNECTION		
Standard		
G 1/4 gas male (DIN 3852-A)		1
7/16-20 UNF-2A male (SAE 4 for AS4395-E)		2
G 1/2A (DIN 16288)		3
On request		
G 1/4 gas female		4
1/8-27 NPT female		5
1/4 - 18 NPT female		6
1/4 - 18 NPT male		7
M14 x 1.5 male		8
1/8 - 27 NPT male		9
G 1/4 gas male (DIN 3852-E)		E
M12 x 1.5 male		R
7/16-20 UNF-2A male (SAE 4 for J1926-2) (*)		K
7/16-20 UNF-2A female (SAE 4)		F

(*) Max. working pressure:
630 bar (9137 psi)

ELECTRICAL CONNECTION		
Standard		
4-pole connector solenoid		E
Shielded cable		F
4 pole connector M12 x 1		Z
On request		
4-pole connector microsolenoid		M
7 pole connector		P
6 pole connector		V

Mechanical and/or electrical characteristics differing from standard may be arranged on request.

RESPONSE TIME

V Fast (< 1 msec)

ACCURACY

H ± 0.25% FSO Typical

M ± 0.5% FSO Typical

MEASUREMENT RANGE

bar		bar		psi	
N01U	-1..+1 *	B25U	0..25	V15U	-15..+15 *
N02U	-1..+2 *	B03D	0..30	V03D	-15..+30 *
N03U	-1..+3 *	B04D	0..40	V05D	-15..+50 *
N05U	-1..+5	B05D	0..50	V75U	-15..+75
N01D	-1..+10	B06D	0..60	V01C	-15..+100
B03U	0..3	B01C	0..100	P05D	0..50
B04U	0..4	B16D	0..160	P75U	0..75
B05U	0..5	B02C	0..200	P01C	0..100
B06U	0..6	B25D	0..250	P15D	0..150
B07U	0..7	B35D	0..350	P25D	0..250
B01D	0..10	B04C	0..400	P03C	0..300
B16U	0..16	B05C	0..500	P05C	0..500
B02D	0..20			P75D	0..750
* only M class				P01M	0..1000
				P15C	0..1500
				P25C	0..2500
				P03M	0..3000
				P05M	0..5000
				P75C	0..7500

CALIBRATION STANDARDS

Instruments manufactured by Gefran are calibrated against precision pressure calibration equipment which is traceable to International Standards.

Es: TK - E - 1 - E - B04C - H - V

Pressure transmitter TK with 4 to 20 mA output signal, G1/4 male pressure connection, DIN 43650A electrical connector, 0...400 bar pressure range, ± 0.25% FSO accuracy, 1 msec response time





WINDPOWER

Pressure Transmitters TSA

- Industrial automation
- Test Benches/Test Stands
- Blowing machines
- Pneumatic Automation
- Engine Test beds
- Weather stations
- Absolute measurements



Series TSA transmitters are based on silicon piezoresistive sensing element in wheatstone bridge configuration. Thanks to highly stable electronic components, these transmitters can be used in applications requiring long-distance signal transmission or in smart control systems. TSA pressure transmitters were developed mainly for pressure measurement in industrial refrigeration and air conditioning, compressor and pumps. They are also used for monitoring and control on automatic machines and general purpose industrial applications.

	Output signal	VOLTAGE	CURRENT
Accuracy (1)		± 0.15% FSO typical; ± 0.2% FSO max (gauge ranges)	± 0.15% FSO typical; ± 0.25% FSO max (absolute ranges)
Resolution		Infinite	see table
Overpressure (without degrading performance) (2)		see table	see table
Pressure containment (Burst test) (3)		see table	see table
Pressure media		Fluid compatible with AISI 316 Stainless steel, AISI 304, NBR, Viton	
Body materials		AISI 304 Stainless steel and Nylon 66GF35V0	
Power supply		15...30Vdc	10...30Vdc
Supply sensitivity		< 0.0015% FSO/V	> 1000 MΩ@ 50Vdc
Insulation resistance			
Zero output signal		B, C, M, N, P, Q, R	4mA (E)
Full scale output signal		B, C, M, N, P, Q, R	20mA (E)
Max current absorption		< 13mA	< 32mA
Max allowed load		1mA	See diagram
Long term stability		< 0.1% FSO/per year (ranges ≥ 250mbar)	
Operating temperature range (process)		-20...+85°C (-4...+185°F)	
Compensated temperature range		-10...+85°C (+14...+185°F)	
Storage temperature range		-30...+90°C (-22...+194°F)	
Temperature effects over compensated range (zero-span)		± 0.01% FSO/°C typical (± 0.02% FSO/°C max.) ranges > 1 bar	
Response time (10...90%FSO)		< 1 msec.	
Start-up time		< 500 msec.	
Mounting position effects		Negligible (ranges Ω1 bar)	
Humidity		Up to 100%RH non condensing	
Weight		110 gr. nominal	
Mechanical shock		100 g / 1 msec. according to IEC 68-2-6	
Vibrations		20 g max @ 15-2000Hz according to IEC68-2-6	
Ingress protection		IP65/IP66/IP67	
Output short circuit and reverse polarity protection		YES	
Voltage spike protection		> 2kV burst test, to EN61000-4-4	
CE conformity (89/336 Directive)		EMC Emissions EN61000-6-3	
		EMC Immunity EN61000-6-2 (10V/m)	

FSO = Full Scale Output

1 BFSL method (Best Fit Straight Line): includes combined effects of Non-Linearity, Hysteresis and Repeatability

2 tested for more than 1000 strokes with single duration < 2msec.

3 tested for more than 100 strokes with single duration < 2msec.

MEASUREMENT RANGE (Bar)	0.05	0.1	0.25	0.5	1	0.8-1.2	2	2.5	4	5	6	7	10	16	20	25	30	40	50	60
Overpressure	3	3	2	4	5	3	10	12.5	20	20	35	35	40	80	80	90	90	90	90	90
Burst test	10	10	2.5	5	10	10	20	25	40	50	50	70	100	120	120	120	120	120	120	120
Absolute ranges ≥ 2 bar: overpressure 3xFS; burst test > 200bar																				

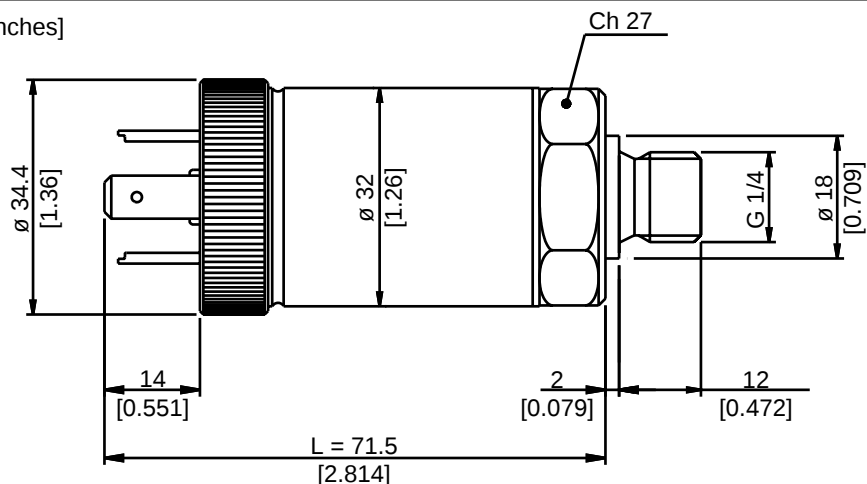
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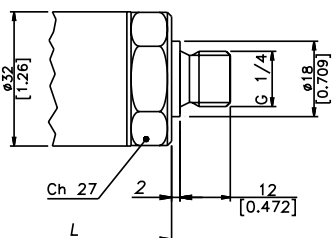
INSTALLATION DRAWINGS

Dimensions: mm [inches]

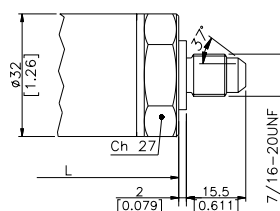


PRESSURE CONNECTION

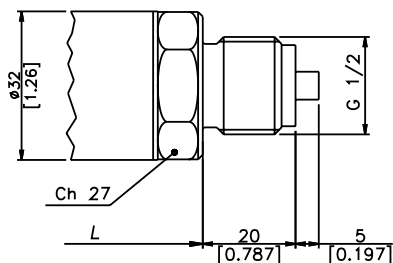
(1) G 1/4 MALE (DIN 3852-A)



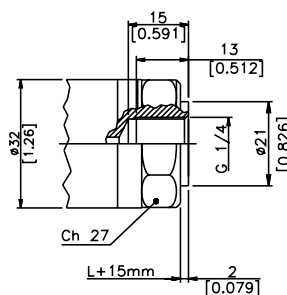
(2) SAE 04 AS4395 - E



(3) G 1/2 A (DIN 16288)

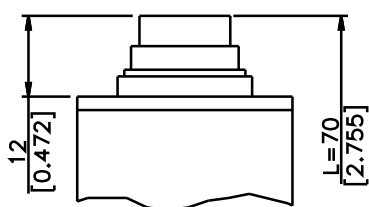


(4) G 1/4 FEMALE

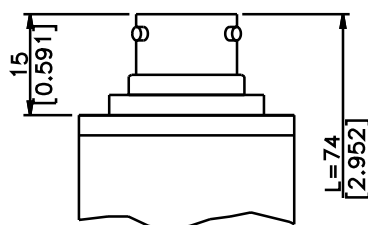


ELECTRICAL CONNECTION

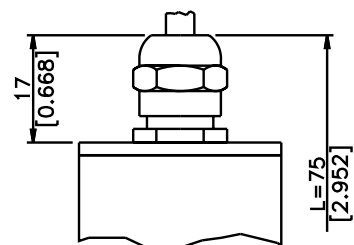
P - 7 pole connector



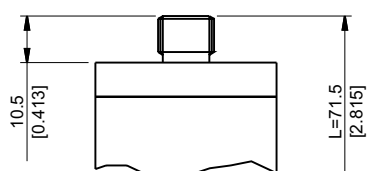
V - 6 pole connector



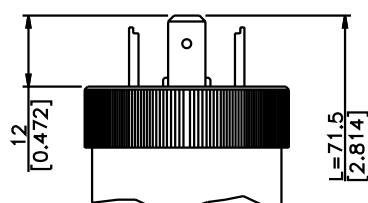
F - 4 pole connector



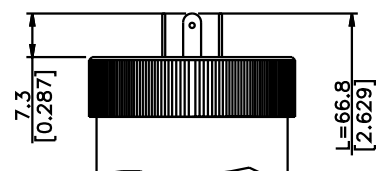
Z - 4 pole connector
M12x1



E - 4 pole connector
solenoid

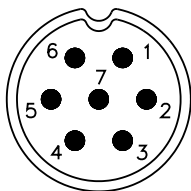


M - 4 pole connector
microsolenoid



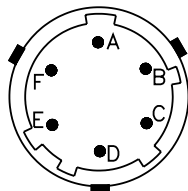
ELECTRICAL CONNECTION - Connectors

P - 7 pole connector



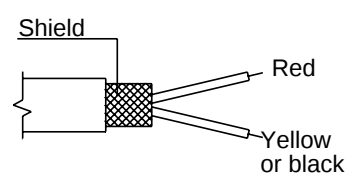
Male connector 09-127-09-07
Protection IP67

V - 6 pole connector



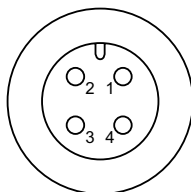
Male connector VPT02A10-6PT2
Protection IP66

F - 2-4 pole cable



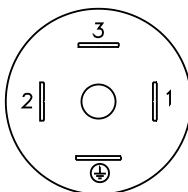
Shielded cable 2x0.25 - 2m. (output E)
Protection IP65

Z - 4-pole male connector M12 x 1

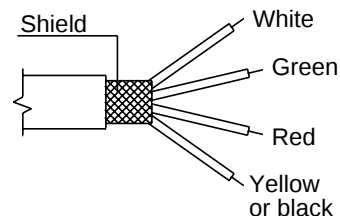


4 pole male connector 713 series
Protection IP67

E - 4 pole solenoid connector M - 4 pole microsolenoid connector



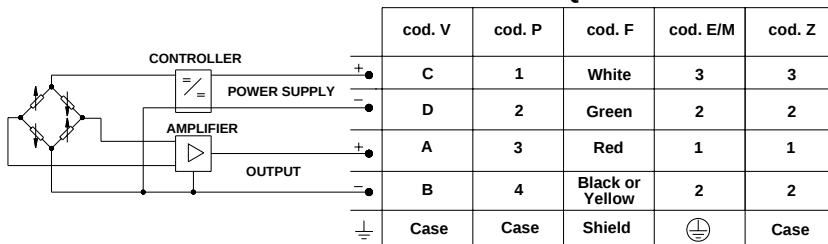
E - Solenoid DIN 43650A - ISO4400
Protection IP65
M - Microsolenoid DIN 43650C - ISO4400
Protection IP65



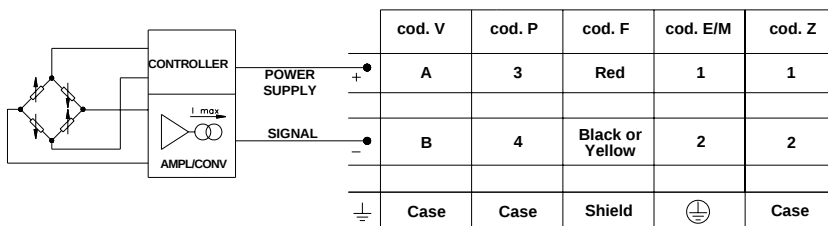
Shielded cable 4x0.25 - 1m
Protection IP65

ELECTRICAL CONNECTION - connection diagrams

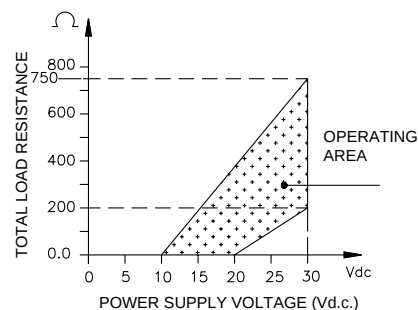
VOLTAGE AMPLIFIED OUTPUT - mod. B/C/M/N/P/Q/R



CURRENT AMPLIFIED OUTPUT - mod. E



LOAD DIAGRAM (Output current)



ACCESSORIES ON REQUEST

Connectors Plugs

Connection E

3 poles connector + ground DIN43650A ISO4400 **CON 006**
Prot. IP65

Connection Z

4 poles connector
Prot. IP67

CON 293

Connection M

3 poles connector + ground DIN43650C ISO4400 **CON 008**
Prot. IP65

Connection P

7 poles female cable connector Prot. IP67

CON 321

Connection V

6 poles female cable connector Prot. IP66

CON 300

EXTENSION CABLES

6-pin connector with 8m (25ft) cable
6-pin connector with 15m (50ft) cable
6-pin connector with 30m (100ft) cable
Other lengths

C08WLS

C15WLS

C30WLS

consult factory

Cable color code

Conn.	Wire
A	Red
B	Yellow/Black
C	White
D	Green
E	Blue
F	Orange

ORDERING INFORMATION

Pressure transmitter

TSA



OUTPUT SIGNAL		
Standard		
4 .. 20 mA		E
0 .. 10 Vdc		N
On request		
0.1 .. 5.1 Vdc		B
0.1 .. 10.1 Vdc		C
0 .. 5 Vdc		M
1 .. 5 Vdc		P
1 .. 10 Vdc		Q
1 .. 6 Vdc		R

PRESSURE CONNECTION		
Standard		
G 1/4 gas male		1
On request		
7/16-20 UNF-2A male (SAE 4 for AS4395-E)		2
G 1/2A (DIN 16288)		3
G 1/4 gas female		4
1/8-27 NPT female		5
1/4-18 NPT female		6
1/4-18 NPT male		7
M14 x 1.5 male		8
1/8-27 NPT male		9
G 1/4 male (DIN 3852-E)		E
M12 x 1.5 male		R
7/16-20 UNF-2A male (SAE 4 for J1926-2)		K
7/16-20 UNF-2A female (SAE 4)		F

ELECTRICAL CONNECTION		
4-pole connector solenoid		E
Shielded cable		F
Connector M12x1 4 pole		Z
4-pole connector microsolenoid		M
7 pole connector		P
6 pole connector		V

Mechanical and/or electrical characteristics differing from standard may be arranged on request.

RESPONSE TIME

V Fast (< 1 msec)

ACCURACY

T $\pm 0.15\%$ FSO typical

G Gauge

A Absolute

MEASUREMENT RANGE

bar		psi	
BV05	0..0.05	P01U	0..1
BV10	0..0.1	P2V5	0..2.5
BV25	0..0.25	P05U	0..5
BV50	0..0.5	P15U	0..15
B01U	0..1	P18U	11..18
B1V2	0.8..1.2	P03D	0..30
B02U	0..2	P05D	0..50
B2V5	0..2.5	P75U	0..75
B04U	0..4	P01C	0..100
B05U	0..5	P15D	0..150
B06U	0..6	P25D	0..250
B07U	0..7	P03C	0..300
B01D	0..10	P05C	0..500
B16U	0..16	P75D	0..750
B02D	0..20	P01M	0..1000
B25U	0..25		
B03D	0..30		
B04D	0..40		
B05D	0..50		
B06D	0..60		

■ = Range available also "Absolute"

B1V2 = Range available only "Absolute" (Barometric)

P18U = Range available only "Absolute" (Barometric)

Note: The measurement range B1V2 is for absolute pressure from 0.8 to 1.2 bar and is defined as "Barometric". The signal output is scaled from 800mbar (i.e. 4mA) to 1200mbar (i.e. 20mA).

CALIBRATION STANDARDS

Instruments manufactured by Gefran are calibrated against precision pressure calibration equipment which is traceable to International Standards.

Ex.: **TSA - N - 1 - P - B03D - G - T - V**

Pressure transmitter TSA with 0..10Vdc output signal, G 1/4 male pressure connection, 7 pole connector, pressure range 0..30 bar gauge, $\pm 0.15\%$ FSO accuracy, 1msec response time.

