



This symbol present on the product label stands for further indications on product manual. For correct and safe installation, follow the instructions and observe the warnings contained in this manual. No hazards shall arise by any reasonably foreseeable misuse in a way not intended, and not described in this manual. The complete manual is available for download from the website www.gefran.com.
UL file number E216851

Main Features

- **Ranges:** from 1 to 1000 bar
- **Nominal Output Signal:**
4...20mA (2 wires)
0...10Vdc / 0.1...5.1Vdc / 0.1...10.1Vdc / 0...5Vdc /
1...5Vdc / 1...6Vdc / 1...10Vdc / 0.2...10.2Vdc (3 wires)
0.5...4.5Vdc (3 wires - ratiometric)
- **Compact size**
- **Wetted parts:** Stainless steel
- **SIL 2 certified according to IEC/EN 62061:2005**

KS transmitters are based on film sensing element deposited on stainless steel diaphragm.

Thanks to the latest state of the art SMD electronics and compact all stainless steel construction, these products are extremely robust and reliable, with SIL2 certification supplied as standard.

KS transmitters are suitable for all industrial applications, specially on hydraulics (presses, pumps, power pack, fluid power, etc.) with severe conditions usually with high level of shock, vibration, and pressure and temperature peaks.

TECHNICAL DATA

Output signal	VOLTAGE		RATIOMETRIC	CURRENT
Non Linearity (BFSL)	± 0.15% FS (typ) ± 0.25% FS (max)			
Hysteresis	+ 0.1% FS (typ) + 0.15% FS (max)			
Repeatability	± 0.025% FS (typ) ± 0.05% FS (max)			
Zero offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Span offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Accuracy at room temperature (1)	< ± 0.5% FS			
Pressure ranges (2)	From 1 bar to 1000 bar (See table)			
Resolution	Infinite			
Overpressure (without degrading performance)	See table			
Pressure containment (burst test)	See table			
Pressure Media	Fluids compatible with Stainless Steel AISI 430F and 17-4 PH			
Housing	Stainless Steel AISI 304			
Power supply (4)	B/M/P R N/C/T/Q	10...30Vdc 11...30Vdc 15...30Vdc	5Vdc ± 0,25V	10...30Vdc
Max current absorption	15mA			35mA
Dielectric strenght	250 Vdc			
Zero output signal	B/M/P/R/N/C/T/Q		0.5Vdc (X)	4 mA (E)
Full scale output signal	B/M/P/R/N/C/T/Q		4.5Vdc (X)	20 mA (E)
Allowed load	≥ 5KΩ			see load diagram
Long term stability	< 0.2% FS/per year			
Operating temperature range (process)	-40...+125°C (-40...+257°F)			
Operating temperature range (ambient) (5)	-40...+105°C (-40...+221°F)			
Compensated temperature range	-20...+85°C (-4...+185°F)			
Storage temperature range	-40...+125°C (-40...+257°F)			
Temperature effects over compensated range (zero)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Temperature effects over compensated range (span)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Response time (10...90%FS)	< 1 msec.			
Warm-up time (3)	< 30 sec.			
Mounting position effects	Negligible			
Humidity	Up to 100%RH non-condensing			
Weight	80-120 gr. nominal			
Mechanical shock	100g/11msec according to IEC 60068-2-27			
Vibrations	20g max at 10...2000 Hz according to IEC 60068-2-6			
Ingress protection	IP65/IP67 (M12 version) with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker			
Output short circuit and reverse polarity protection	YES			
EC Conformity	According to Directive 2014/30/EU			

FS = Full scale

1 Incl. Non-Linearity, Hysteresis, Repeatability, Zero-offset and Span-offset (acc. to IEC 61298-2)

2 The operating pressure range is intended from 0.5% to 100% FS

3 Time within which the rated performance is achieved

4 The devices must be supplied with a Class 2 Power Supply (as for NEC) or LPS Power Supply (as for EN 60950). If devices are permanently connected to the machine it's requested an external switch or circuit breaker and external overcurrent protection.

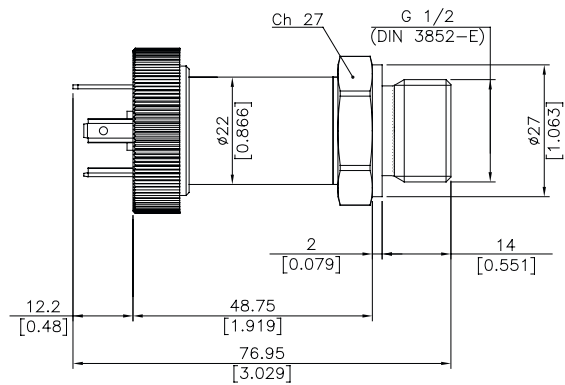
5 See possible restrictions in the paragraphs "Electrical connections" and "Accessories on request".

PRESSURE RANGES

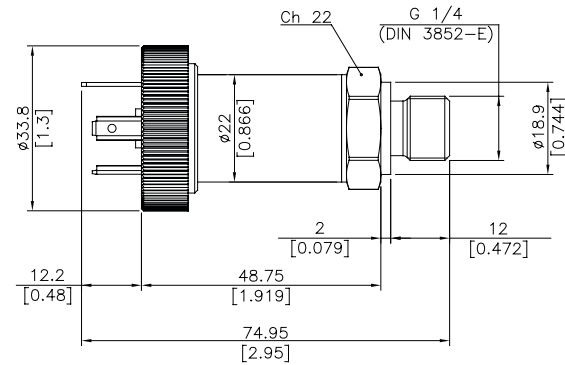
RANGE (Bar)	1	1.6	2	2.5	4	6	10	16	20	25	40	60	100	160	200	250	400	600	1000
Overpressure (Bar)	6	6	6	10	8	12	20	32	40	50	80	120	200	320	400	500	800	1200	1200
Burst pressure (Bar)	9	9	9	15	16	24	40	64	80	100	160	240	400	640	800	1000	1500	1500	1500

INSTALLATION DRAWINGS

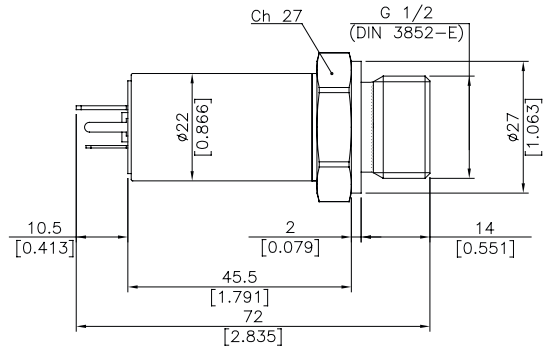
Connector EN 175301-803 Form A



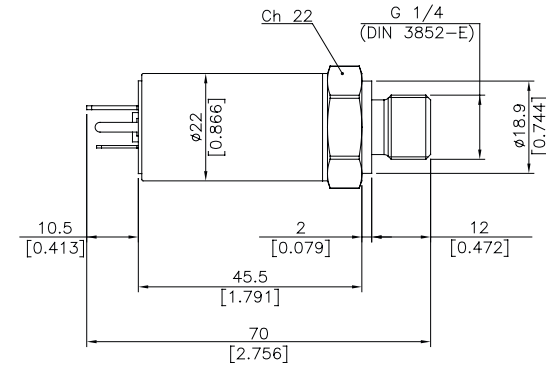
Connector EN 175301-803 Form A



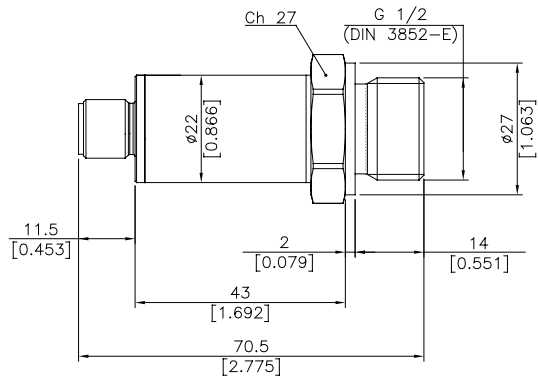
Connector EN 175301-803 Form C



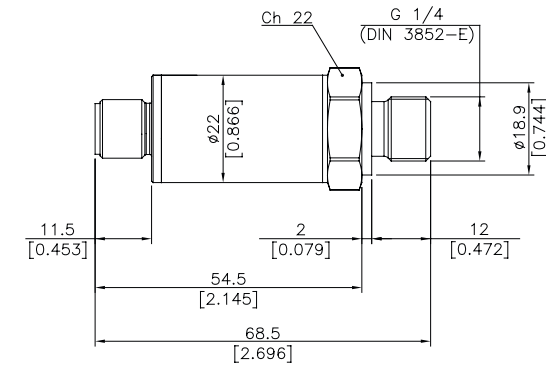
Connector EN 175301-803 Form C



Connector M12x1

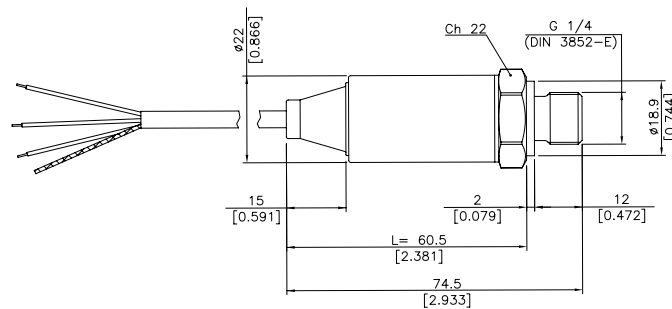


Connector M12x1



Cable output

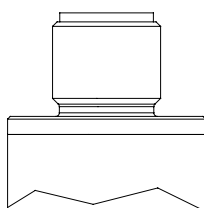
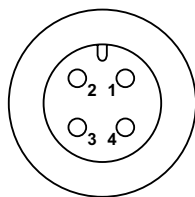
3 Pole cable



Dimensions in mm. [inches]

ELECTRICAL CONNECTION - Connectors

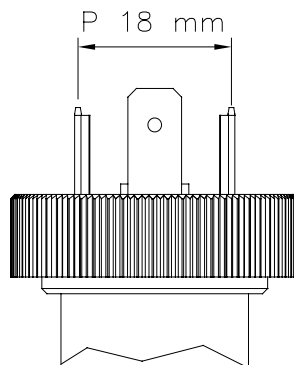
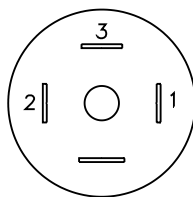
Z – 4 pin male connector M12 x 1*



4 pin
male connector
Protection IP67

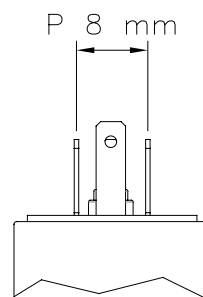
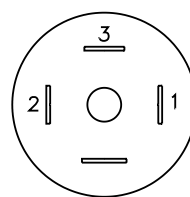
* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strength threadlocker

E - EN 175301-803



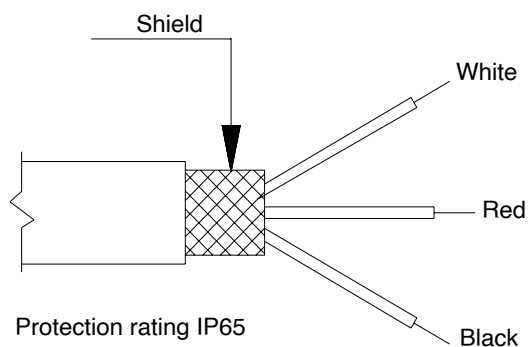
4 pin DIN
Form A
Protection IP65

C – EN 175301-803



4 pin MicroDIN
Form C
Protection IP65

F – 3 pole cable Shielded cable 3x26 AWG - Length 1 m



ELECTRICAL CONNECTION – RATINGS

ELECTRICAL CONNECTION	IP RATING	cULus CERTIFIED	TEMPERATURE RATINGS **
F – 2/3 pole cable *	IP65		-10+105°C
Z - 4 pole male connector M12 x 1	IP67	X	-40+105 °C
E - 4 pole solenoid connector EN 175301-803-A	IP65	X	-40+105 °C
C - 4 pole microsolenoid connector EN 175301-803-C	IP65	X	-40+105 °C

*UL certified version not available.

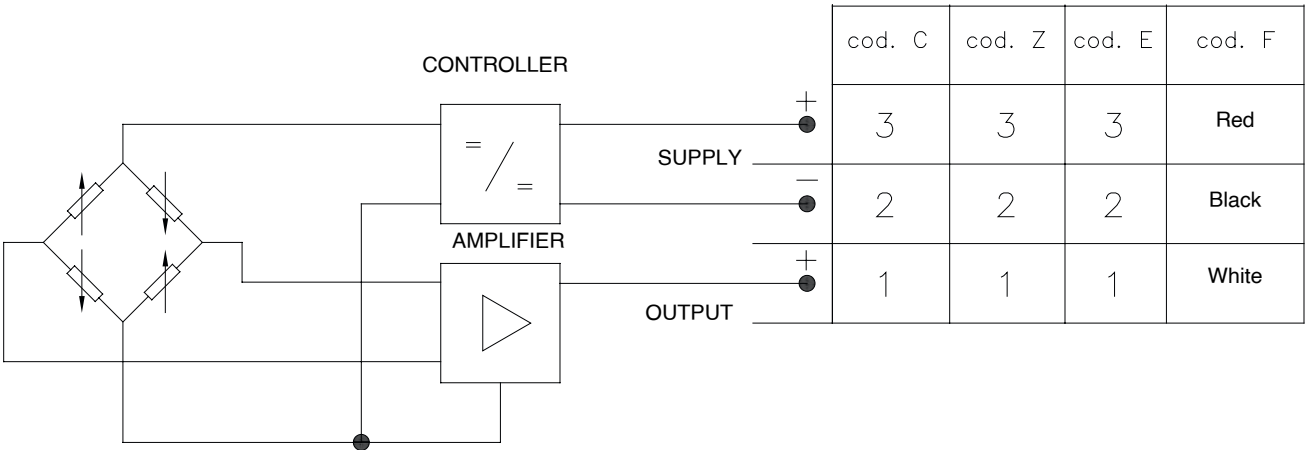
** The operating temperature ranges, except where expressly indicated, are also applicable in the UL scope.

Notes:

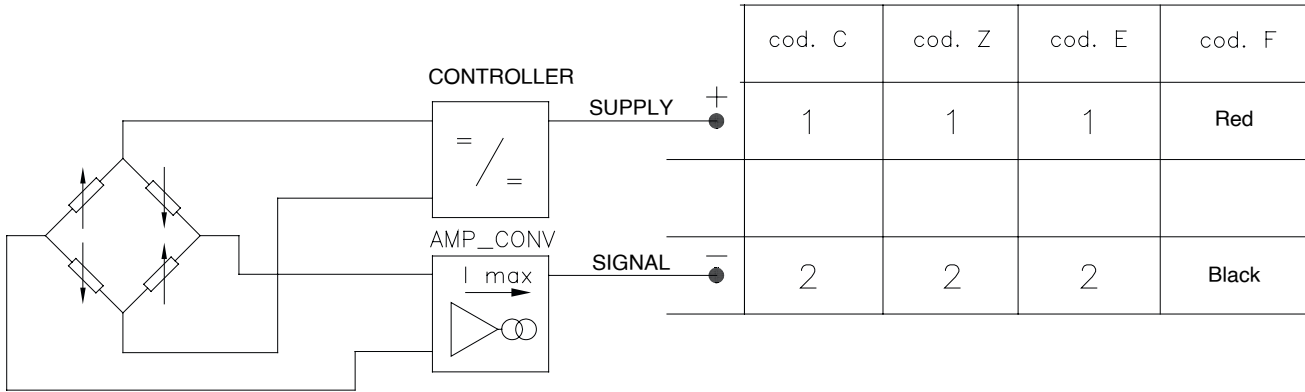
1. The IP rating specified in this document normally applies with the suitable female connector plugged-in and properly wired.
2. The pressure transducers with measuring range of 60 bar and below require vented cable and/or mating connector, to allow the compensation of the atmospheric pressure reference.

ELECTRICAL CONNECTION - Connection diagrams

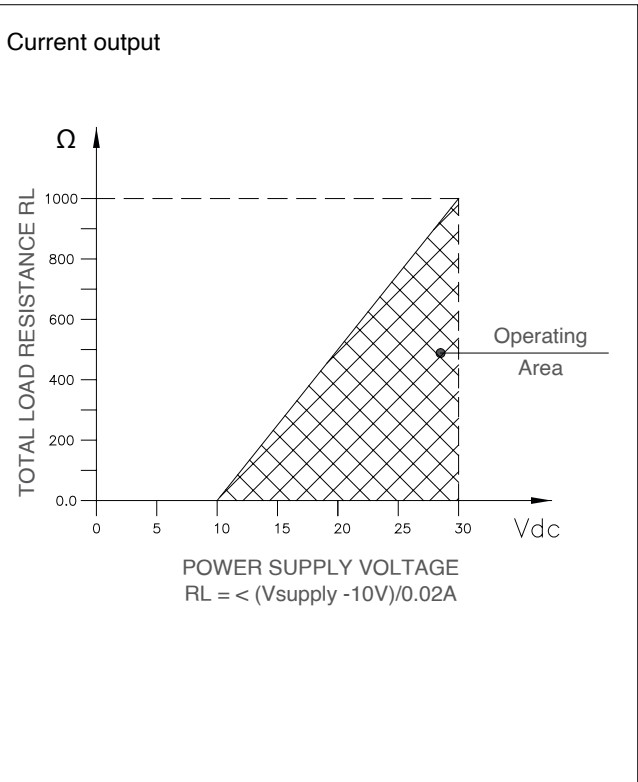
VOLTAGE AMPLIFIED OUTPUT



CURRENT AMPLIFIED OUTPUT - mod. E



LOAD DIAGRAM



PRESSURE PEAKS PROTECTION

Many industrial applications, especially in hydraulics, could present dangerous phenomena like cavitation, liquid hammer or pressure peaks, due for example to pumps start and stop or fast closing of a valve. These phenomena can be harmful to the transducer.

The KS series, upon request, is available with an integrated pressure snubber which, thanks to a 0.5 mm diameter through hole, eliminates these harmful peaks, to protect the transducer.

Contact Gefran to request the version with pressure snubber.

SIL CERTIFICATION (Safety Integrity Level) – FUNCTIONAL SAFETY

Safety is a critical requirement especially for machine builders. The new European Directive 2006/42/EC defines all the essential requirements in this regard.

In the context of functional safety, the European directive is received by the technical standard **IEC / EN 62061** "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems"(SRECS)

KS pressure transmitters are certified SIL CL 2 by the Certification Body TÜV Rheinland with Test Report No.FS 28712235, in accordance with that rule, for use in applications "High Demand Mode" and then may be used in SRECS systems of machinery, where the safety variable to control will be the pressure of a fluid.

- NOTES:**
- 1) The SIL certification is supplied standard, and is available for pressure ranges from 0 ... 4 bar and above
 - 2) For models with voltage amplified output, SIL certification is only available for versions with output at atmospheric pressure greater than zero volts (ie: 0.1 ... 10.1 V)
 - 3) Full specifications and installation and user manual of KS certified SIL 2 can be downloaded directly from the website www.gefran.com

ACCESSORIES ON REQUEST

MATING CONNECTORS

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **
Connection E EN 175301-803 4 pin DIN Form A (P 18) - H=32	IP65	CON064	X	-40+125 °C -40+65°C (cULus)
		CON113	X	-40+90°C
Connection E 3 pole connector + ground EN 175301-803-A H28	IP65	CON045	X	-40+125 °C -40+65°C (cULus)
		CON114	X	-40+90°C
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	IP65	CON047		-40+125 °C
		CON116	X	-40+90°C
Connection Z 4 pole female cable connector M12x1	IP67	CON293		-25+85°C
		CON087	X	-25+90°C
Connection Z 4 pole female cable connector, 90° M12x1	IP67	CON050		-25+85°C
		CON088	X	-25+90°C

EXTENSION CABLES*

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **	CABLE COLOR CODE	
					Pin	Wire
Connection Z female connector M12x1 + 2/3/5/10m of cable	* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker	CAV220	X	-30+80°C	1	Brown
		CAV221			2	White
		CAV222			3	Blue
		CAV223			4	Black

* Other lengths on request

** The nominal temperature ranges, except where expressly indicated, are also applicable in the UL scope.

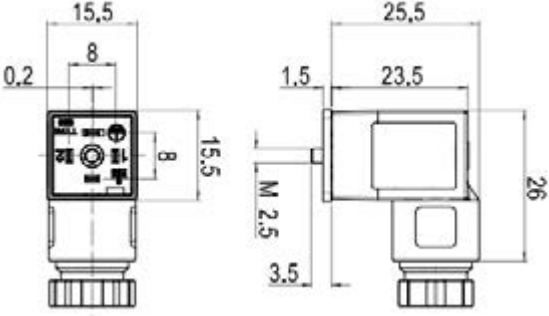
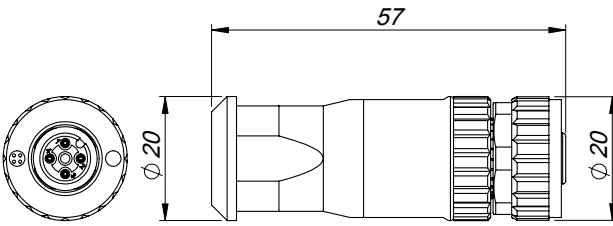
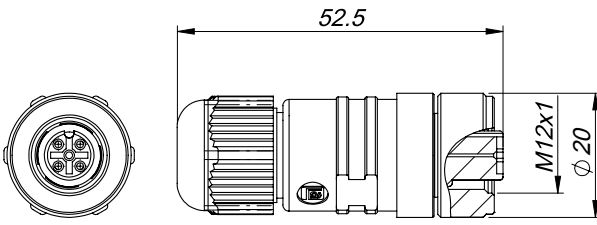
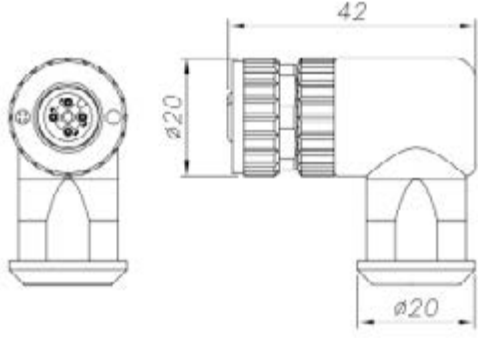
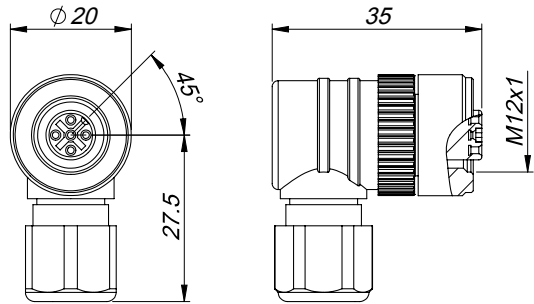
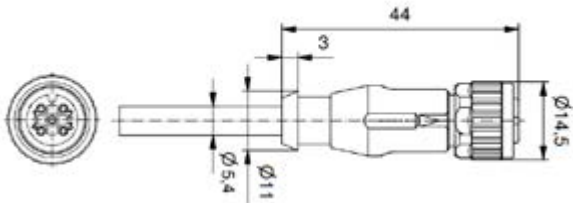
For cULus applications extension cables, a 3 pole 26AWG Style 2464 cable is advised

SEALING CODE ACCORDING TO PROCESS CONNECTION

PROCESS CONNECTION	STEEL + NBR	NBR	FKM
G 1/4 gas male DIN E			GUA036
G 1/2 gas male DIN E		GUA380	
M12x1,5			GUA166
G 1/4 gas male DIN A	RON300		
M14x1,5			GUA036
M10x1			GUA385
G3/8			GUA190
G1/8			GUA385
7/16-20 UNF		GUA175	

ACCESSORIES DRAWINGS

DESCRIPTION	CODE	DRAWING
Connection E EN 175301-803 4 pin DIN Form A (P 18) H=32	CON064	
	CON113	
Connection E 3 pole connector + ground EN 175301-803-A H=28	CON045	
	CON114	
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON047	

DESCRIPTION	CODE	DRAWING
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON116	
Connection Z 4 pole female cable connector M12x1	CON293	
	CON087	
Connection Z 4 pole female cable connector, 90° M12x1	CON050	
	CON088	
Connection Z female connector M12x1 + 2/3/5/10m of cable	CAV220	
	CAV221	
	CAV222	
	CAV223	

ORDERING INFORMATION

Pressure transmitter

KS

□ □ □ □ □ M V □

2130 x □ x 00

000=vers. standard

00U=vers. cULus listed

OUTPUT SIGNAL

0.1...5.1 Vdc	B
0.1...10.1 Vdc	C
4...20 mA	E
0...5 Vdc	M*
0...10 Vdc	N*
1...5 Vdc	P
1...6 Vdc	R
1...10 Vdc	Q
0.2...10.2 Vdc	T
0.5...4.5 Vdc	X
* SIL Certification not available	

PRESSURE CONNECTIONS

G 1/4 gas male (DIN 3852-E)	E
G 1/2 gas male (DIN 3852-E)	3

ELECTRICAL CONNECTIONS

4-pin connector microDIN (P8)	C
4 pin connector M12x1	Z
4-pin connector DIN (P18)	E
2/3 pole shielded cable (1m)	F(*)

(*) UL certification not available

NOTE: - cULus listed version is available on request (see ordering information)

- Available on request different types of output signal, pressure connections and electrical connections. Please consult Factory.

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

RESPONSE TIME

V Fast (< 1 msec)

NON-LINEARITY

M ± 0,25% FS BFSL

MEASUREMENT RANGE

	bar		bar
B01U	1*	B04D	40
B1V6	1.6*	B06D	60
B02U	2*	B01C	100
B2V5	2.5*	B16D	160
B04U	4	B02C	200
B06U	6	B25D	250
B01D	10	B04C	400
B16U	16	B06C	600
B02D	20	B01M	1000
B25U	25		
*SIL and UL certification not available			

CALIBRATION STANDARDS

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

Ex: KS - E - E - C - B04C - M - V

Pressure transmitter KS with 4 to 20 mA output signal, G1/4 male (DIN 3852-E) pressure connection, microDIN electrical connector, 0...400 bar pressure range, ± 0.25% FS non-linearity, 1 msec response time.

Sensors are manufactured in compliance with: - EMC 2014/30/EU Compatibility Directive
- RoHS 2011/65/EU Directive
- 2006/42/EC Machinery Directive

Electrical installation requirements and Conformity certificate are available on our web site: www.gefran.com

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

GEFRAN spa

via Sebina, 74

25050 PROVAGLIO D'ISEO (BS) - ITALIA

tel. 0309888.1 - fax. 0309839063

Internet: <http://www.gefran.com>

GEFRAN

DTS_KS-SIL2_07-2021_ENG



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UL file number E216851

Main Features

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4...20mA (2 wires)
0...10Vdc / 0.1...5.1Vdc / 0.1...10.1Vdc / 0...5Vdc /
1...5Vdc / 1...6Vdc / 1...10Vdc / 0.2...10.2Vdc (3 wires)
0.5...4.5Vdc (3 wires - ratiometric)
- **Compact size**
- **Wetted parts:** Stainless steel
- **SIL 2 certified according to IEC/EN 62061:2005**

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Hysteresis			$+ 0.1\%$ FS (typ) $+ 0.15\%$ FS (max)	
Repeatability			$\pm 0.025\%$ FS (typ) $\pm 0.05\%$ FS (max)	
Zero offset tolerance			$\pm 0.15\%$ FS (typ) $\pm 0.25\%$ FS (max)	
Span offset tolerance			$\pm 0.15\%$ FS (typ) $\pm 0.25\%$ FS (max)	
Accuracy at room temperature (1)			$< \pm 0.5\%$ FS	
Pressure ranges (2)			From 1 bar to 1000 bar (See table)	
Resolution			Infinite	
Overpressure (without degrading performance)			See table	
Pressure containment (burst test)			See table	
Pressure Media	Fluids compatible with Stainless Steel AISI 430F and 17-4 PH			
Housing	Stainless Steel AISI 304			
Power supply (4)	B/M/P R N/C/T/Q	10...30Vdc 11...30Vdc 15...30Vdc	5Vdc ± 0.25 V	10...30Vdc
Max current absorption	15mA			35mA
Dielectric strenght	250 Vdc			
Zero output signal	B/M/P/R/N/C/T/Q		0.5Vdc (X)	4 mA (E)
Full scale output signal	B/M/P/R/N/C/T/Q		4.5Vdc (X)	20 mA (E)
Allowed load	$\geq 5K\Omega$			see load diagram
Long term stability	$< 0.2\%$ FS/per year			
Operating temperature range (process)	$-40...+125^{\circ}\text{C}$ ($-40...+257^{\circ}\text{F}$)			
Operating temperature range (ambient) (5)	$-40...+105^{\circ}\text{C}$ ($-40...+221^{\circ}\text{F}$)			
Compensated temperature range	$-20...+85^{\circ}\text{C}$ ($-4...+185^{\circ}\text{F}$)			
Storage temperature range	$-40...+125^{\circ}\text{C}$ ($-40...+257^{\circ}\text{F}$)			
Temperature effects over compensated range (zero)	$\pm 0.01\%$ FS/ $^{\circ}\text{C}$ typ. ($\pm 0.02\%$ FS/ $^{\circ}\text{C}$ max.)			
Temperature effects over compensated range (span)	$\pm 0.01\%$ FS/ $^{\circ}\text{C}$ typ. ($\pm 0.02\%$ FS/ $^{\circ}\text{C}$ max.)			
Response time (10...90%FS)	< 1 msec.			
Warm-up time (3)	< 30 sec.			
Mounting position effects	Negligible			
Humidity	Up to 100%RH non-condensing			
Weight	80-120 gr. nominal			
Mechanical shock	100g/11msec according to IEC 60068-2-27			
Vibrations	20g max at 10...2000 Hz according to IEC 60068-2-6			
Ingress protection	IP65/IP67 (M12 version) with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker			
Output short circuit and reverse polarity protection	YES			
EC Conformity	According to Directive 2014/30/EU			

FS = Full scale

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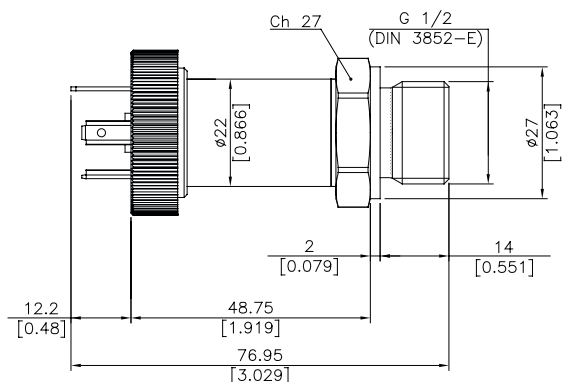
5 See possible restrictions in the paragraphs "Electrical connections" and "Accessories on request".

PRESSURE RANGES

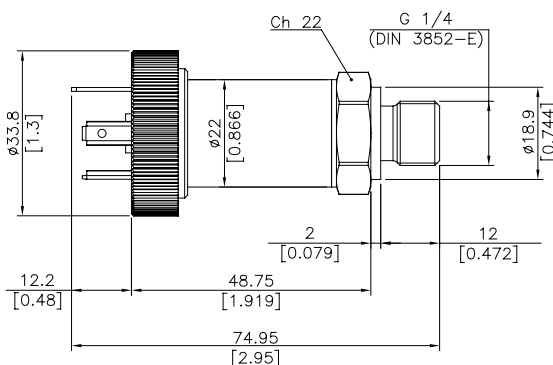
RANGE (Bar)	1	1.6	2	2.5	4	6	10	16	20	25	40	60	100	160	200	250	400	600	1000
Overpressure (Bar)	6	6	6	10	8	12	20	32	40	50	80	120	200	320	400	500	800	1200	1200
Burst pressure (Bar)	9	9	9	15	16	24	40	64	80	100	160	240	400	640	800	1000	1500	1500	1500

INSTALLATION DRAWINGS

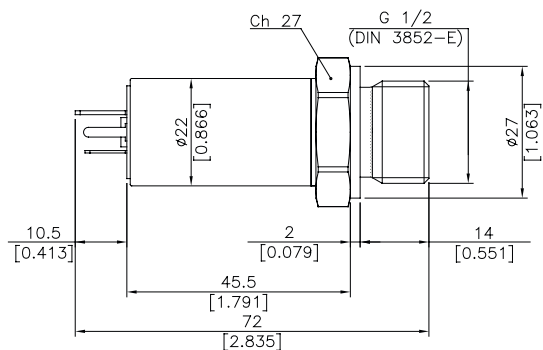
Connector EN 175301-803 Form A



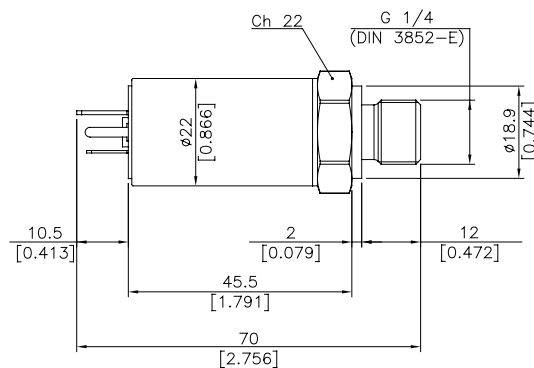
Connector EN 175301-803 Form A



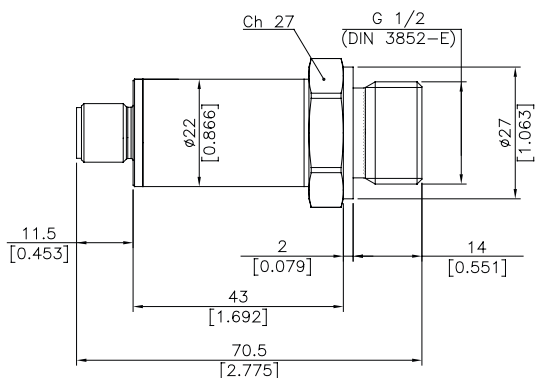
Connector EN 175301-803 Form C



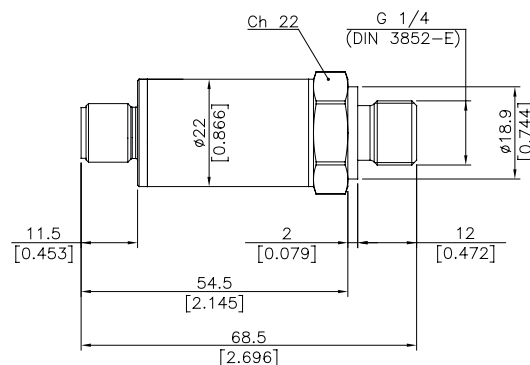
Connector EN 175301-803 Form C



Connector M12x1

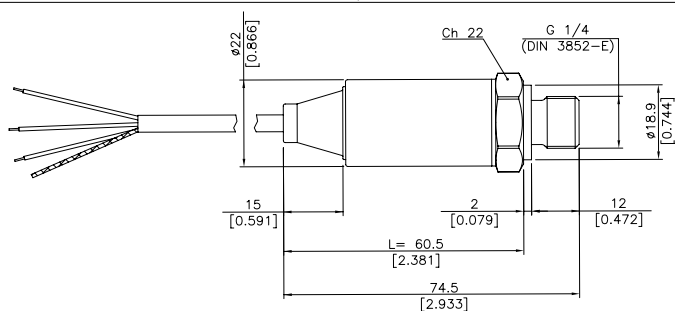


Connector M12x1



Cable output

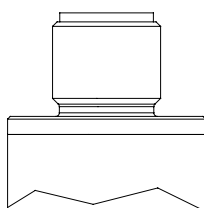
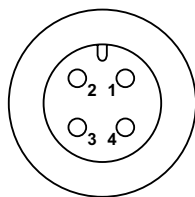
3 Pole cable



Dimensions in mm. [inches]

ELECTRICAL CONNECTION - Connectors

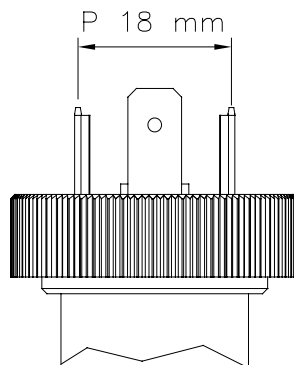
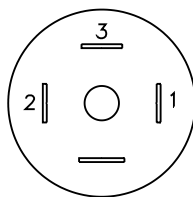
Z – 4 pin male connector M12 x 1*



4 pin
male connector
Protection IP67

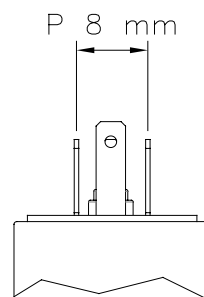
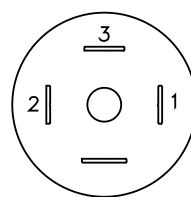
* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strength threadlocker

E - EN 175301-803



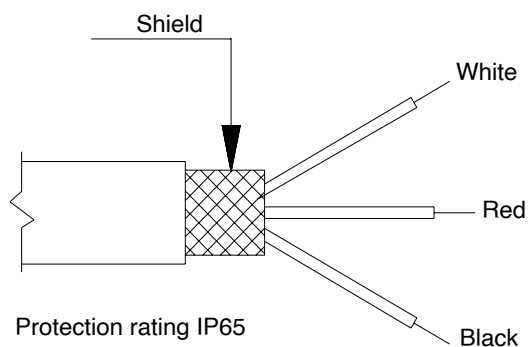
4 pin DIN
Form A
Protection IP65

C – EN 175301-803



4 pin MicroDIN
Form C
Protection IP65

F – 3 pole cable Shielded cable 3x26 AWG - Length 1 m



ELECTRICAL CONNECTION – RATINGS

ELECTRICAL CONNECTION	IP RATING	cULus CERTIFIED	TEMPERATURE RATINGS **
F – 2/3 pole cable *	IP65		-10+105°C
Z - 4 pole male connector M12 x 1	IP67	X	-40+105 °C
E - 4 pole solenoid connector EN 175301-803-A	IP65	X	-40+105 °C
C - 4 pole microsolenoid connector EN 175301-803-C	IP65	X	-40+105 °C

*UL certified version not available.

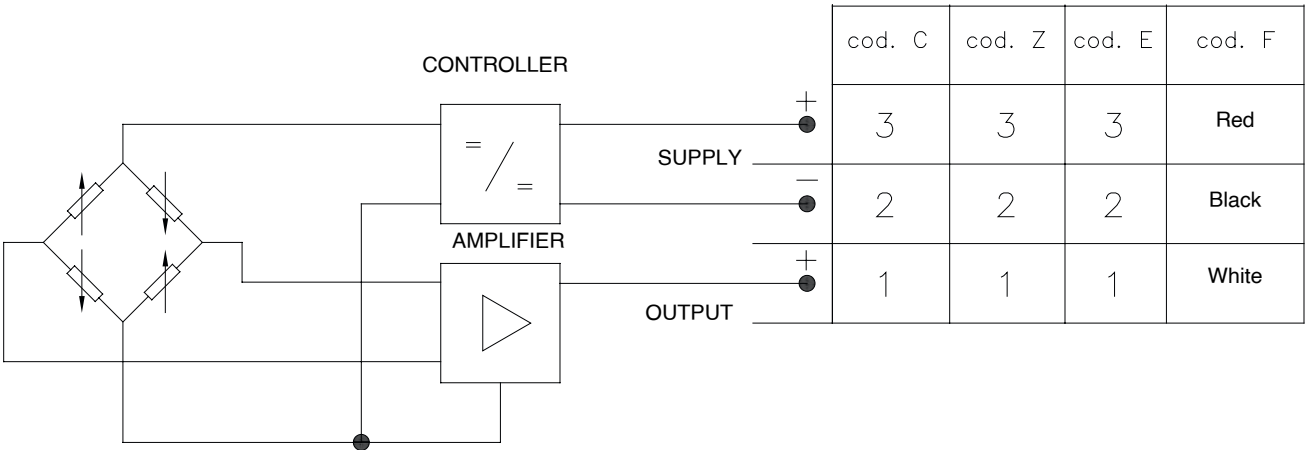
** The operating temperature ranges, except where expressly indicated, are also applicable in the UL scope.

Notes:

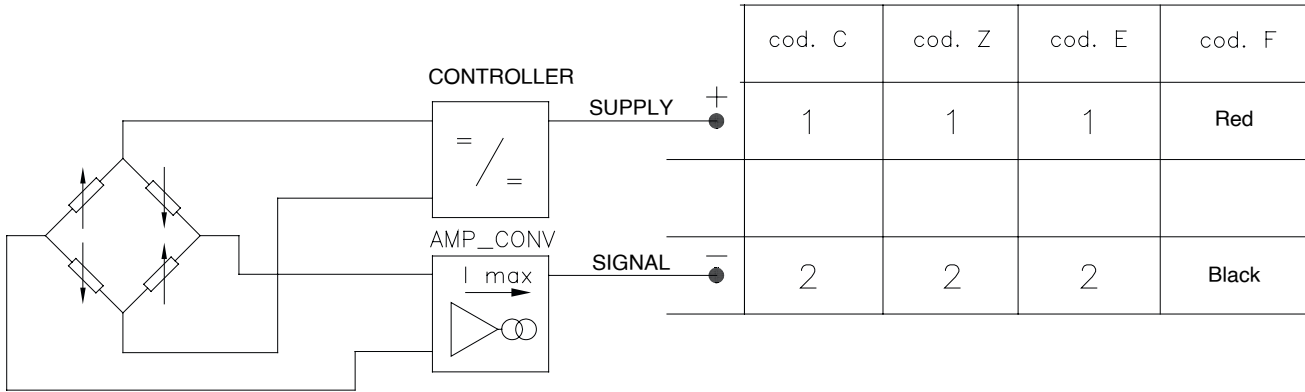
1. The IP rating specified in this document normally applies with the suitable female connector plugged-in and properly wired.
2. The pressure transducers with measuring range of 60 bar and below require vented cable and/or mating connector, to allow the compensation of the atmospheric pressure reference.

ELECTRICAL CONNECTION - Connection diagrams

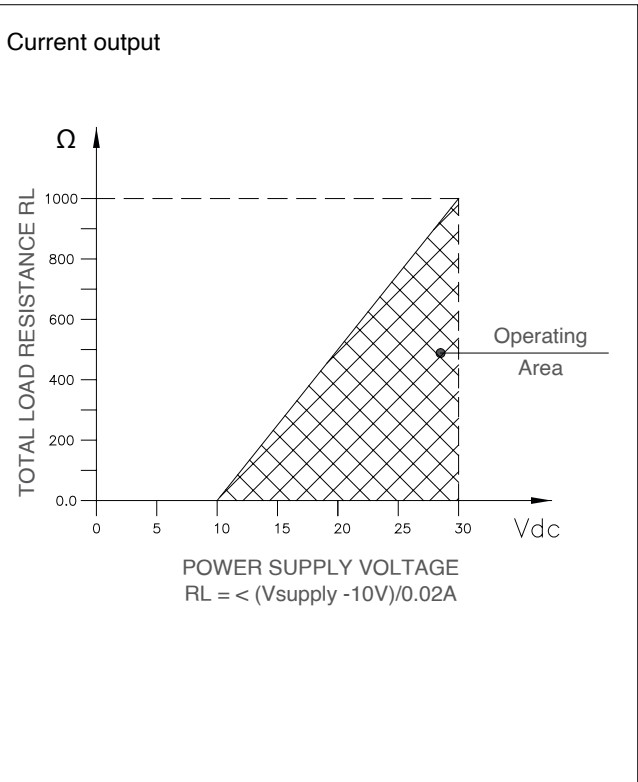
VOLTAGE AMPLIFIED OUTPUT



CURRENT AMPLIFIED OUTPUT - mod. E



LOAD DIAGRAM



PRESSURE PEAKS PROTECTION

Many industrial applications, especially in hydraulics, could present dangerous phenomena like cavitation, liquid hammer or pressure peaks, due for example to pumps start and stop or fast closing of a valve. These phenomena can be harmful to the transducer.

The KS series, upon request, is available with an integrated pressure snubber which, thanks to a 0.5 mm diameter through hole, eliminates these harmful peaks, to protect the transducer.

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- NOTES:**
- 1) The SIL certification is supplied standard, and is available for pressure ranges from 0 ... 4 bar and above
 - 2) For models with voltage amplified output, SIL certification is only available for versions with output at atmospheric pressure greater than zero volts (ie: 0.1 ... 10.1 V)
 - 3) Full specifications and installation and user manual of KS certified SIL 2 can be downloaded directly from the website www.gefran.com

ACCESSORIES ON REQUEST

MATING CONNECTORS

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **
Connection E EN 175301-803 4 pin DIN Form A (P 18) - H=32	IP65	CON064	X	-40+125 °C -40+65°C (cULus)
		CON113	X	-40+90°C
Connection E 3 pole connector + ground EN 175301-803-A H28	IP65	CON045	X	-40+125 °C -40+65°C (cULus)
		CON114	X	-40+90°C
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	IP65	CON047		-40+125 °C
		CON116	X	-40+90°C
Connection Z 4 pole female cable connector M12x1	IP67	CON293		-25+85°C
		CON087	X	-25+90°C
Connection Z 4 pole female cable connector, 90° M12x1	IP67	CON050		-25+85°C
		CON088	X	-25+90°C

EXTENSION CABLES*

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **	CABLE COLOR CODE	
					Pin	Wire
Connection Z female connector M12x1 + 2/3/5/10m of cable	* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strength threadlocker	CAV220	X	-30+80°C	1	Brown
		CAV221			2	White
		CAV222			3	Blue
		CAV223			4	Black

* Other lengths on request

** The nominal temperature ranges, except where expressly indicated, are also applicable in the UL scope.

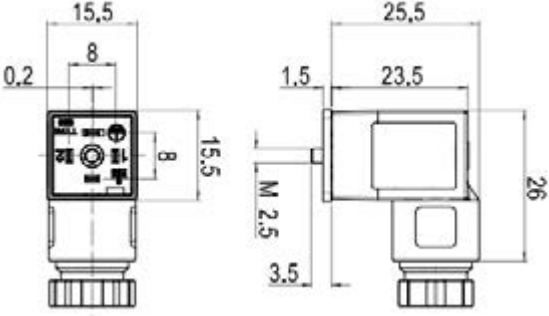
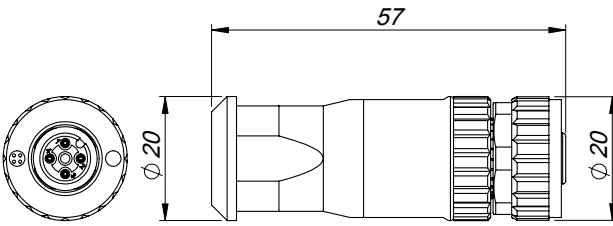
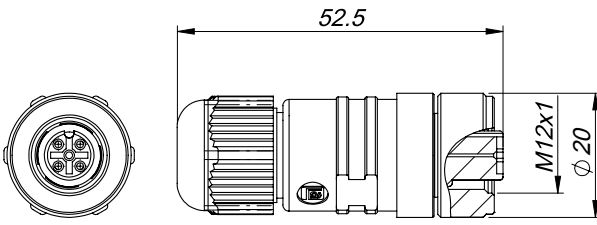
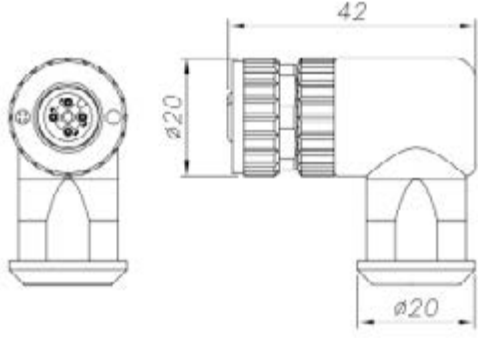
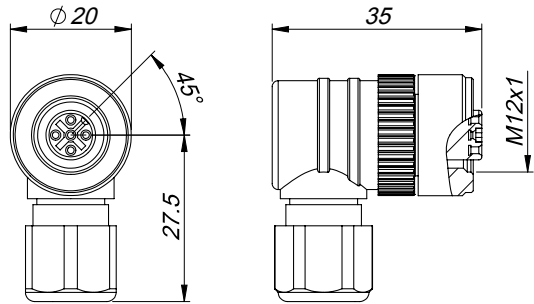
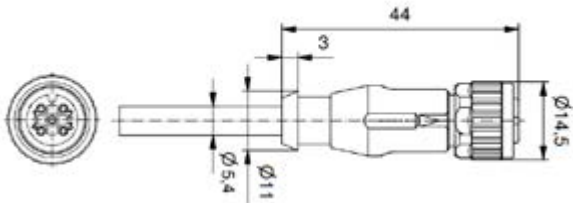
For cULus applications extension cables, a 3 pole 26AWG Style 2464 cable is advised

SEALING CODE ACCORDING TO PROCESS CONNECTION

PROCESS CONNECTION	STEEL + NBR	NBR	FKM
G 1/4 gas male DIN E			GUA036
G 1/2 gas male DIN E		GUA380	
M12x1,5			GUA166
G 1/4 gas male DIN A	RON300		
M14x1,5			GUA036
M10x1			GUA385
G3/8			GUA190
G1/8			GUA385
7/16-20 UNF		GUA175	

ACCESSORIES DRAWINGS

DESCRIPTION	CODE	DRAWING
Connection E EN 175301-803 4 pin DIN Form A (P 18) H=32	CON064	
	CON113	
Connection E 3 pole connector + ground EN 175301-803-A H=28	CON045	
	CON114	
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON047	

DESCRIPTION	CODE	DRAWING
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON116	
Connection Z 4 pole female cable connector M12x1	CON293	
	CON087	
Connection Z 4 pole female cable connector, 90° M12x1	CON050	
	CON088	
Connection Z female connector M12x1 + 2/3/5/10m of cable	CAV220	
	CAV221	
	CAV222	
	CAV223	

ORDERING INFORMATION

Pressure transmitter

KS

□ □ □ □ □ M V □

2130 x □ x 00

000=vers. standard

00U=vers. cULus listed

OUTPUT SIGNAL

0.1...5.1 Vdc	B
0.1...10.1 Vdc	C
4...20 mA	E
0...5 Vdc	M*
0...10 Vdc	N*
1...5 Vdc	P
1...6 Vdc	R
1...10 Vdc	Q
0.2...10.2 Vdc	T
0.5...4.5 Vdc	X
* SIL Certification not available	

PRESSURE CONNECTIONS

G 1/4 gas male (DIN 3852-E)	E
G 1/2 gas male (DIN 3852-E)	3

ELECTRICAL CONNECTIONS

4-pin connector microDIN (P8)	C
4 pin connector M12x1	Z
4-pin connector DIN (P18)	E
2/3 pole shielded cable (1m)	F(*)

(*) UL certification not available

NOTE: - cULus listed version is available on request (see ordering information)

- Available on request different types of output signal, pressure connections and electrical connections. Please consult Factory.

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

RESPONSE TIME

V Fast (< 1 msec)

NON-LINEARITY

M ± 0,25% FS BFSL

MEASUREMENT RANGE

	bar		bar
B01U	1*	B04D	40
B1V6	1.6*	B06D	60
B02U	2*	B01C	100
B2V5	2.5*	B16D	160
B04U	4	B02C	200
B06U	6	B25D	250
B01D	10	B04C	400
B16U	16	B06C	600
B02D	20	B01M	1000
B25U	25		
*SIL and UL certification not available			

CALIBRATION STANDARDS

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

Ex: KS - E - E - C - B04C - M - V

Pressure transmitter KS with 4 to 20 mA output signal, G1/4 male (DIN 3852-E) pressure connection, microDIN electrical connector, 0...400 bar pressure range, ± 0.25% FS non-linearity, 1 msec response time.

Sensors are manufactured in compliance with: - EMC 2014/30/EU Compatibility Directive
- RoHS 2011/65/EU Directive
- 2006/42/EC Machinery Directive

Electrical installation requirements and Conformity certificate are available on our web site: www.gefran.com

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

GEFRAN spa

via Sebina, 74

25050 PROVAGLIO D'ISEO (BS) - ITALIA

tel. 0309888.1 - fax. 0309839063

Internet: <http://www.gefran.com>

GEFRAN

DTS_KS-SIL2_07-2021_ENG



This symbol present on the product label stands for further indications on product manual. For correct and safe installation, follow the instructions and observe the warnings contained in this manual. No hazards shall arise by any reasonably foreseeable misuse in a way not intended, and not described in this manual. The complete manual is available for download from the website www.gefran.com.
UL file number E216851

Main Features

- **Ranges:** from 1 to 1000 bar
- **Nominal Output Signal:**
4...20mA (2 wires)
0...10Vdc / 0.1...5.1Vdc / 0.1...10.1Vdc / 0...5Vdc /
1...5Vdc / 1...6Vdc / 1...10Vdc / 0.2...10.2Vdc (3 wires)
0.5...4.5Vdc (3 wires - ratiometric)
- **Compact size**
- **Wetted parts:** Stainless steel
- **SIL 2 certified according to IEC/EN 62061:2005**

KS transmitters are based on film sensing element deposited on stainless steel diaphragm.

Thanks to the latest state of the art SMD electronics and compact all stainless steel construction, these products are extremely robust and reliable, with SIL2 certification supplied as standard.

KS transmitters are suitable for all industrial applications, specially on hydraulics (presses, pumps, power pack, fluid power, etc.) with severe conditions usually with high level of shock, vibration, and pressure and temperature peaks.

TECHNICAL DATA

Output signal	VOLTAGE		RATIOMETRIC	CURRENT
Non Linearity (BFSL)	± 0.15% FS (typ) ± 0.25% FS (max)			
Hysteresis	+ 0.1% FS (typ) + 0.15% FS (max)			
Repeatability	± 0.025% FS (typ) ± 0.05% FS (max)			
Zero offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Span offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Accuracy at room temperature (1)	< ± 0.5% FS			
Pressure ranges (2)	From 1 bar to 1000 bar (See table)			
Resolution	Infinite			
Overpressure (without degrading performance)	See table			
Pressure containment (burst test)	See table			
Pressure Media	Fluids compatible with Stainless Steel AISI 430F and 17-4 PH			
Housing	Stainless Steel AISI 304			
Power supply (4)	B/M/P R N/C/T/Q	10...30Vdc 11...30Vdc 15...30Vdc	5Vdc ± 0,25V	10...30Vdc
Max current absorption	15mA			35mA
Dielectric strenght	250 Vdc			
Zero output signal	B/M/P/R/N/C/T/Q		0.5Vdc (X)	4 mA (E)
Full scale output signal	B/M/P/R/N/C/T/Q		4.5Vdc (X)	20 mA (E)
Allowed load	≥ 5KΩ			see load diagram
Long term stability	< 0.2% FS/per year			
Operating temperature range (process)	-40...+125°C (-40...+257°F)			
Operating temperature range (ambient) (5)	-40...+105°C (-40...+221°F)			
Compensated temperature range	-20...+85°C (-4...+185°F)			
Storage temperature range	-40...+125°C (-40...+257°F)			
Temperature effects over compensated range (zero)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Temperature effects over compensated range (span)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Response time (10...90%FS)	< 1 msec.			
Warm-up time (3)	< 30 sec.			
Mounting position effects	Negligible			
Humidity	Up to 100%RH non-condensing			
Weight	80-120 gr. nominal			
Mechanical shock	100g/11msec according to IEC 60068-2-27			
Vibrations	20g max at 10...2000 Hz according to IEC 60068-2-6			
Ingress protection	IP65/IP67 (M12 version) with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker			
Output short circuit and reverse polarity protection	YES			
EC Conformity	According to Directive 2014/30/EU			

FS = Full scale

1 Incl. Non-Linearity, Hysteresis, Repeatability, Zero-offset and Span-offset (acc. to IEC 61298-2)

2 The operating pressure range is intended from 0.5% to 100% FS

3 Time within which the rated performance is achieved

4 The devices must be supplied with a Class 2 Power Supply (as for NEC) or LPS Power Supply (as for EN 60950). If devices are permanently connected to the machine it's requested an external switch or circuit breaker and external overcurrent protection.

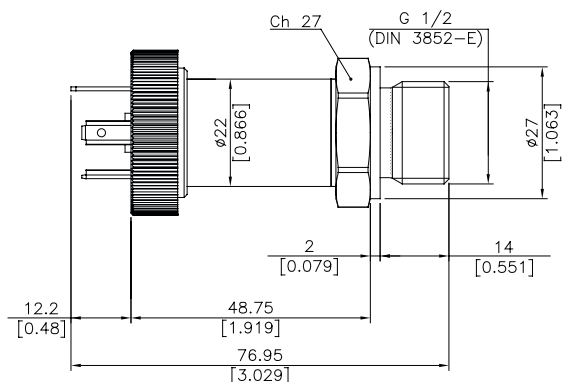
5 See possible restrictions in the paragraphs "Electrical connections" and "Accessories on request".

PRESSURE RANGES

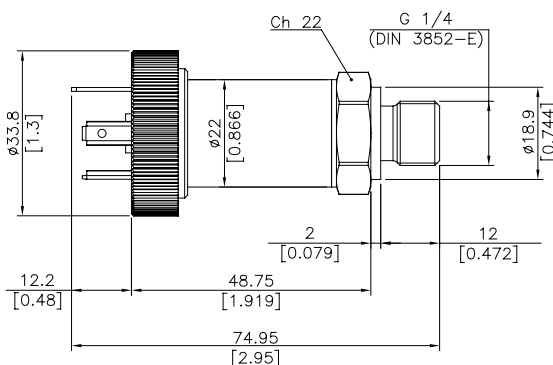
RANGE (Bar)	1	1.6	2	2.5	4	6	10	16	20	25	40	60	100	160	200	250	400	600	1000
Overpressure (Bar)	6	6	6	10	8	12	20	32	40	50	80	120	200	320	400	500	800	1200	1200
Burst pressure (Bar)	9	9	9	15	16	24	40	64	80	100	160	240	400	640	800	1000	1500	1500	1500

INSTALLATION DRAWINGS

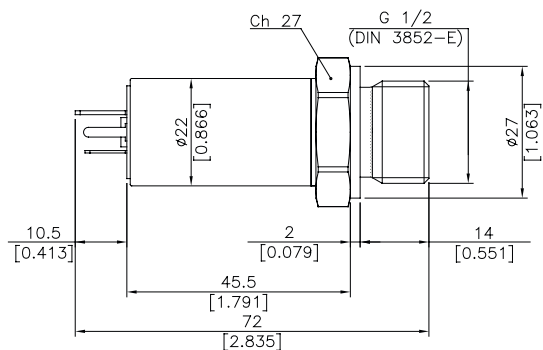
Connector EN 175301-803 Form A



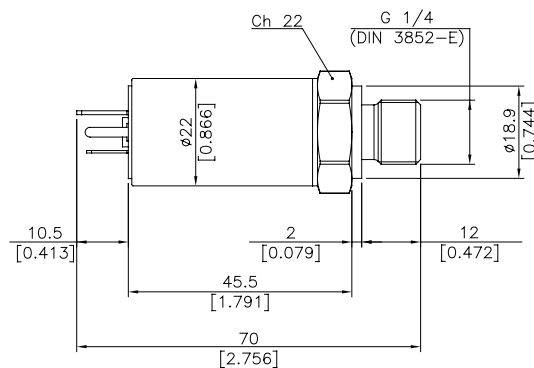
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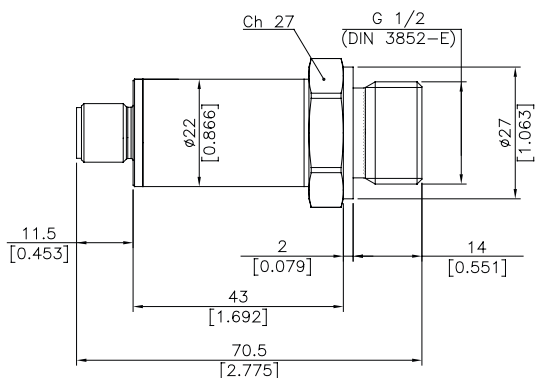
Connector EN 175301-803 Form C



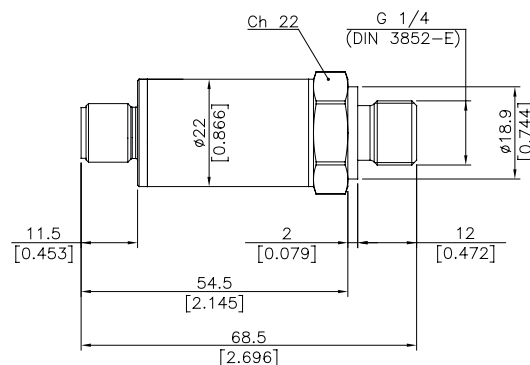
Connector EN 175301-803 Form C



Connector M12x1

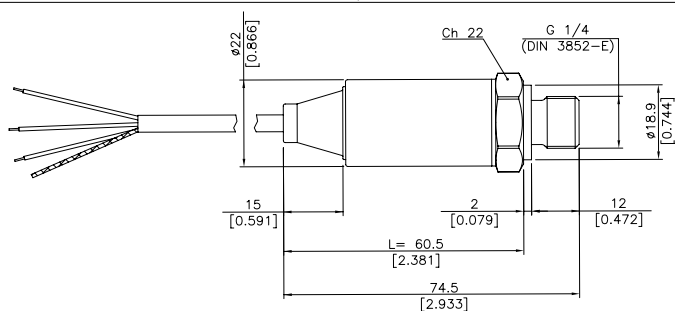


Connector M12x1



Cable output

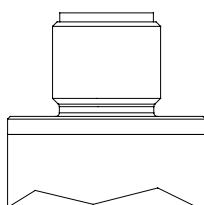
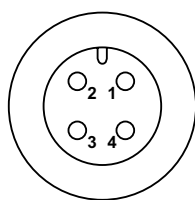
3 Pole cable



Dimensions in mm. [inches]

ELECTRICAL CONNECTION - Connectors

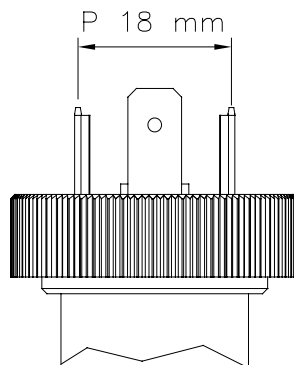
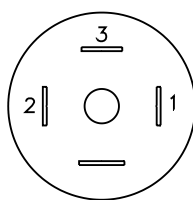
Z – 4 pin male connector M12 x 1*



4 pin
male connector
Protection IP67

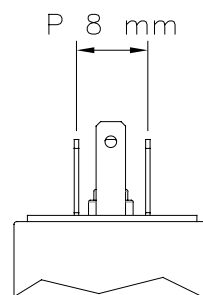
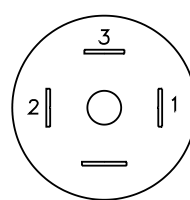
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E - EN 175301-803



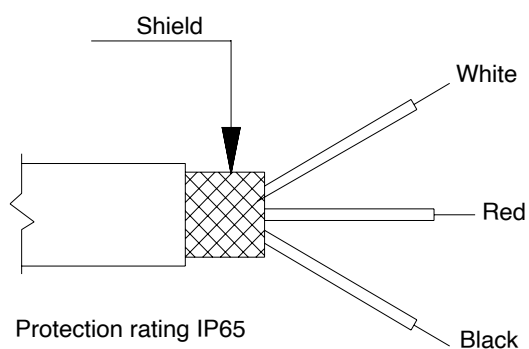
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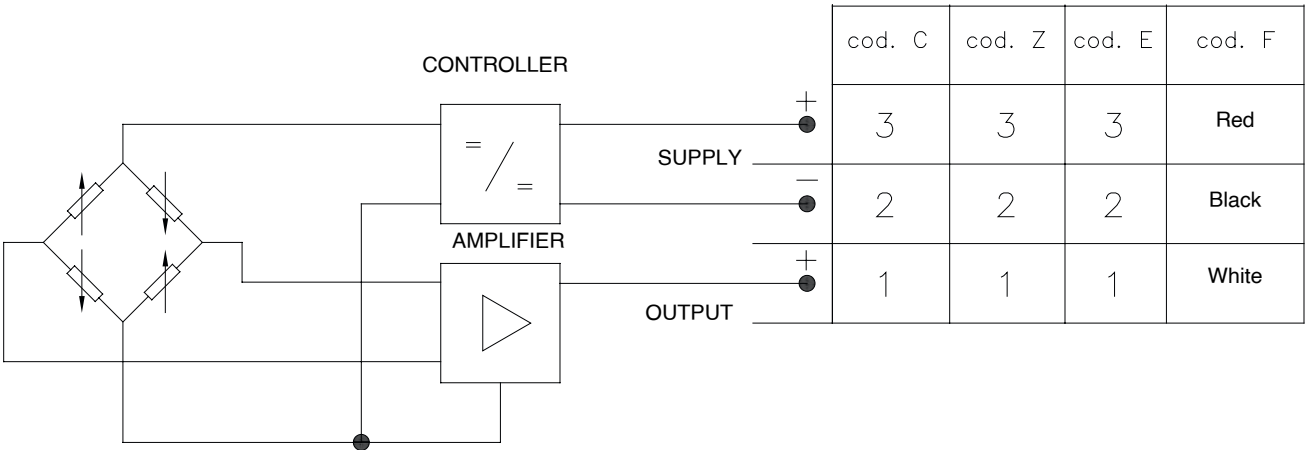
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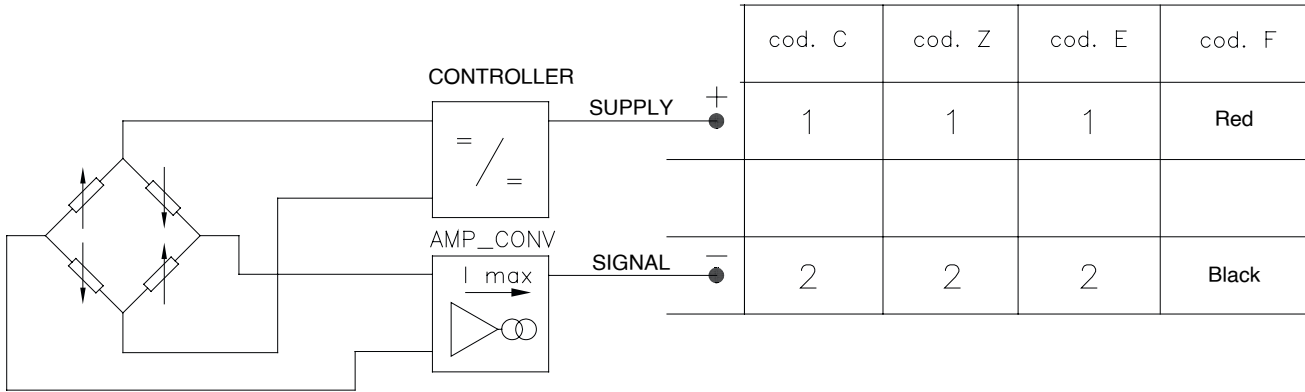
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ELECTRICAL CONNECTION - Connection diagrams

VOLTAGE AMPLIFIED OUTPUT

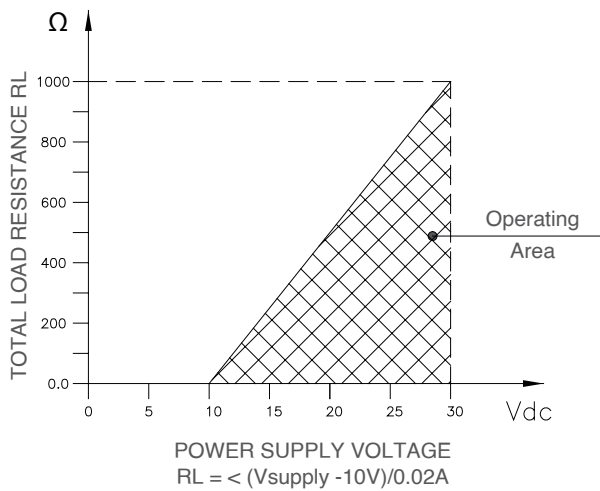


CURRENT AMPLIFIED OUTPUT - mod. E



LOAD DIAGRAM

Current output



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		CON113	X	-40+90°C
Connection E 3 pole connector + ground EN 175301-803-A H28	IP65	CON045	X	-40+125 °C -40+65°C (cULus)
		CON114	X	-40+90°C
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	IP65	CON047		-40+125 °C
		CON116	X	-40+90°C
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EXTENSION CABLES*

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **	CABLE COLOR CODE	
					Pin	Wire
Connection Z female connector M12x1 + 2/3/5/10m of cable	* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker	CAV220	X	-30+80°C	1	Brown
		CAV221			2	White
		CAV222			3	Blue
		CAV223			4	Black

* Other lengths on request

** The nominal temperature ranges, except where expressly indicated, are also applicable in the UL scope.

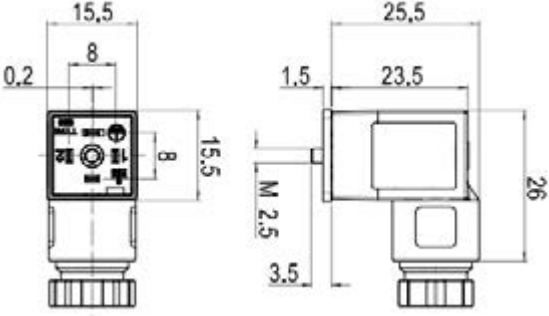
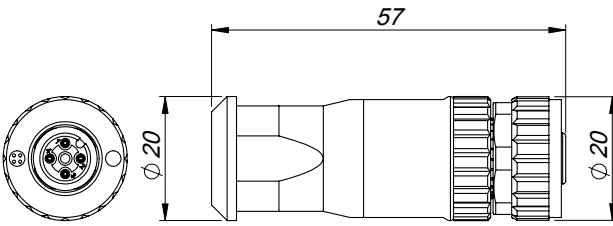
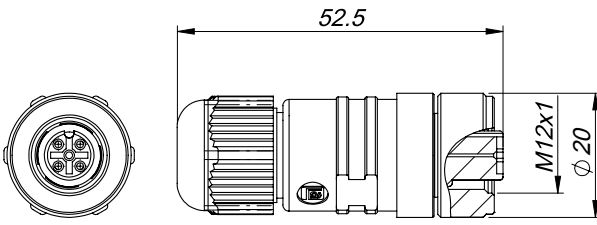
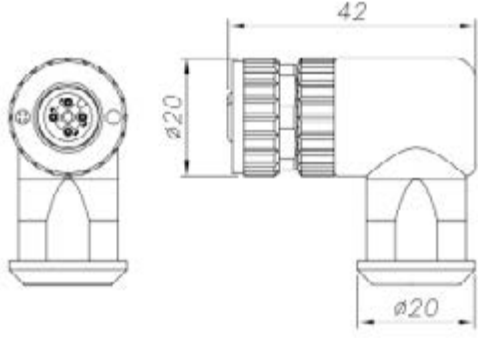
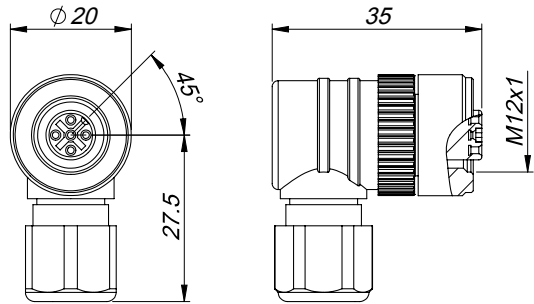
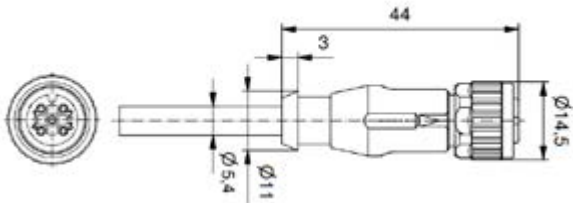
For cULus applications extension cables, a 3 pole 26AWG Style 2464 cable is advised

SEALING CODE ACCORDING TO PROCESS CONNECTION

PROCESS CONNECTION	STEEL + NBR	NBR	FKM
G 1/4 gas male DIN E			GUA036
G 1/2 gas male DIN E		GUA380	
M12x1,5			GUA166
G 1/4 gas male DIN A	RON300		
M14x1,5			GUA036
M10x1			GUA385
G3/8			GUA190
G1/8			GUA385
7/16-20 UNF		GUA175	

ACCESSORIES DRAWINGS

DESCRIPTION	CODE	DRAWING
Connection E EN 175301-803 4 pin DIN Form A (P 18) H=32	CON064	
	CON113	
Connection E 3 pole connector + ground EN 175301-803-A H=28	CON045	
	CON114	
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON047	

DESCRIPTION	CODE	DRAWING
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON116	
Connection Z 4 pole female cable connector M12x1	CON293	
	CON087	
Connection Z 4 pole female cable connector, 90° M12x1	CON050	
	CON088	
Connection Z female connector M12x1 + 2/3/5/10m of cable	CAV220	
	CAV221	
	CAV222	
	CAV223	

ORDERING INFORMATION

Pressure transmitter

KS

□ □ □ □ □ M V □

2130 x □ x 00

000=vers. standard

00U=vers. cULus listed

OUTPUT SIGNAL

0.1...5.1 Vdc	B
0.1...10.1 Vdc	C
4...20 mA	E
0...5 Vdc	M*
0...10 Vdc	N*
1...5 Vdc	P
1...6 Vdc	R
1...10 Vdc	Q
0.2...10.2 Vdc	T
0.5...4.5 Vdc	X
* SIL Certification not available	

PRESSURE CONNECTIONS

G 1/4 gas male (DIN 3852-E)	E
G 1/2 gas male (DIN 3852-E)	3

ELECTRICAL CONNECTIONS

4-pin connector microDIN (P8)	C
4 pin connector M12x1	Z
4-pin connector DIN (P18)	E
2/3 pole shielded cable (1m)	F(*)

(*) UL certification not available

NOTE: - cULus listed version is available on request (see ordering information)

- Available on request different types of output signal, pressure connections and electrical connections. Please consult Factory.

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

RESPONSE TIME

V Fast (< 1 msec)

NON-LINEARITY

M ± 0,25% FS BFSL

MEASUREMENT RANGE

	bar		bar
B01U	1*	B04D	40
B1V6	1.6*	B06D	60
B02U	2*	B01C	100
B2V5	2.5*	B16D	160
B04U	4	B02C	200
B06U	6	B25D	250
B01D	10	B04C	400
B16U	16	B06C	600
B02D	20	B01M	1000
B25U	25		
*SIL and UL certification not available			

CALIBRATION STANDARDS

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

Ex: KS - E - E - C - B04C - M - V

Pressure transmitter KS with 4 to 20 mA output signal, G1/4 male (DIN 3852-E) pressure connection, microDIN electrical connector, 0...400 bar pressure range, ± 0.25% FS non-linearity, 1 msec response time.

Sensors are manufactured in compliance with: - EMC 2014/30/EU Compatibility Directive
- RoHS 2011/65/EU Directive
- 2006/42/EC Machinery Directive

Electrical installation requirements and Conformity certificate are available on our web site: www.gefran.com

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

GEFRAN spa

via Sebina, 74

25050 PROVAGLIO D'ISEO (BS) - ITALIA

tel. 0309888.1 - fax. 0309839063

Internet: <http://www.gefran.com>

GEFRAN

DTS_KS-SIL2_07-2021_ENG



This symbol present on the product label stands for further indications on product manual. For correct and safe installation, follow the instructions and observe the warnings contained in this manual. No hazards shall arise by any reasonably foreseeable misuse in a way not intended, and not described in this manual. The complete manual is available for download from the website www.gefran.com.
UL file number E216851

Main Features

- **Ranges:** from 1 to 1000 bar
- **Nominal Output Signal:**
4...20mA (2 wires)
0...10Vdc / 0.1...5.1Vdc / 0.1...10.1Vdc / 0...5Vdc /
1...5Vdc / 1...6Vdc / 1...10Vdc / 0.2...10.2Vdc (3 wires)
0.5...4.5Vdc (3 wires - ratiometric)
- **Compact size**
- **Wetted parts:** Stainless steel
- **SIL 2 certified according to IEC/EN 62061:2005**

KS transmitters are based on film sensing element deposited on stainless steel diaphragm.

Thanks to the latest state of the art SMD electronics and compact all stainless steel construction, these products are extremely robust and reliable, with SIL2 certification supplied as standard.

KS transmitters are suitable for all industrial applications, specially on hydraulics (presses, pumps, power pack, fluid power, etc.) with severe conditions usually with high level of shock, vibration, and pressure and temperature peaks.

TECHNICAL DATA

Output signal	VOLTAGE		RATIOMETRIC	CURRENT
Non Linearity (BFSL)	± 0.15% FS (typ) ± 0.25% FS (max)			
Hysteresis	+ 0.1% FS (typ) + 0.15% FS (max)			
Repeatability	± 0.025% FS (typ) ± 0.05% FS (max)			
Zero offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Span offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Accuracy at room temperature (1)	< ± 0.5% FS			
Pressure ranges (2)	From 1 bar to 1000 bar (See table)			
Resolution	Infinite			
Overpressure (without degrading performance)	See table			
Pressure containment (burst test)	See table			
Pressure Media	Fluids compatible with Stainless Steel AISI 430F and 17-4 PH			
Housing	Stainless Steel AISI 304			
Power supply (4)	B/M/P R N/C/T/Q	10...30Vdc 11...30Vdc 15...30Vdc	5Vdc ± 0,25V	10...30Vdc
Max current absorption	15mA			35mA
Dielectric strenght	250 Vdc			
Zero output signal	B/M/P/R/N/C/T/Q		0.5Vdc (X)	4 mA (E)
Full scale output signal	B/M/P/R/N/C/T/Q		4.5Vdc (X)	20 mA (E)
Allowed load	≥ 5KΩ			see load diagram
Long term stability	< 0.2% FS/per year			
Operating temperature range (process)	-40...+125°C (-40...+257°F)			
Operating temperature range (ambient) (5)	-40...+105°C (-40...+221°F)			
Compensated temperature range	-20...+85°C (-4...+185°F)			
Storage temperature range	-40...+125°C (-40...+257°F)			
Temperature effects over compensated range (zero)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Temperature effects over compensated range (span)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Response time (10...90%FS)	< 1 msec.			
Warm-up time (3)	< 30 sec.			
Mounting position effects	Negligible			
Humidity	Up to 100%RH non-condensing			
Weight	80-120 gr. nominal			
Mechanical shock	100g/11msec according to IEC 60068-2-27			
Vibrations	20g max at 10...2000 Hz according to IEC 60068-2-6			
Ingress protection	IP65/IP67 (M12 version) with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker			
Output short circuit and reverse polarity protection	YES			
EC Conformity	According to Directive 2014/30/EU			

FS = Full scale

1 Incl. Non-Linearity, Hysteresis, Repeatability, Zero-offset and Span-offset (acc. to IEC 61298-2)

2 The operating pressure range is intended from 0.5% to 100% FS

3 Time within which the rated performance is achieved

4 The devices must be supplied with a Class 2 Power Supply (as for NEC) or LPS Power Supply (as for EN 60950). If devices are permanently connected to the machine it's requested an external switch or circuit breaker and external overcurrent protection.

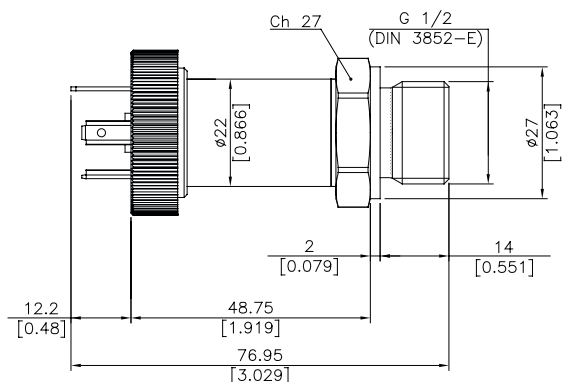
5 See possible restrictions in the paragraphs "Electrical connections" and "Accessories on request".

PRESSURE RANGES

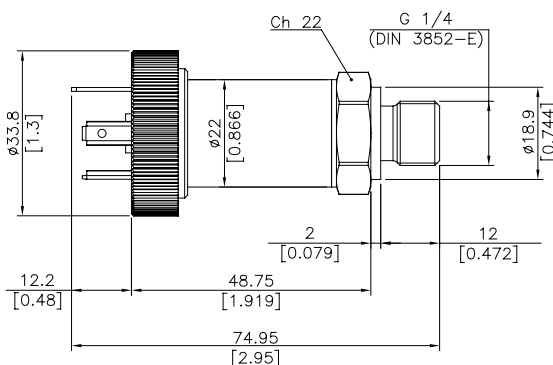
RANGE (Bar)	1	1.6	2	2.5	4	6	10	16	20	25	40	60	100	160	200	250	400	600	1000
Overpressure (Bar)	6	6	6	10	8	12	20	32	40	50	80	120	200	320	400	500	800	1200	1200
Burst pressure (Bar)	9	9	9	15	16	24	40	64	80	100	160	240	400	640	800	1000	1500	1500	1500

INSTALLATION DRAWINGS

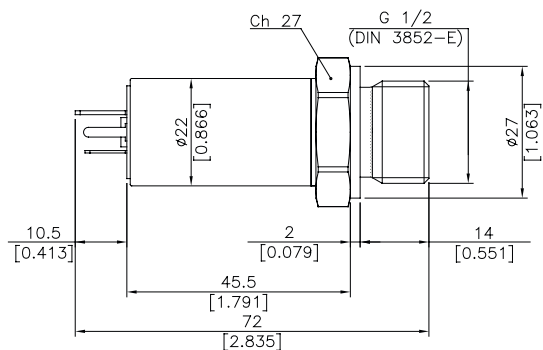
Connector EN 175301-803 Form A



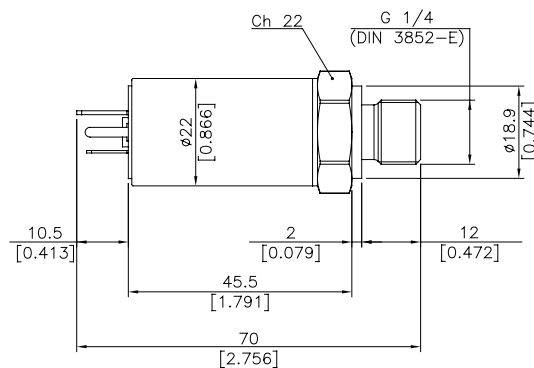
Connector EN 175301-803 Form A



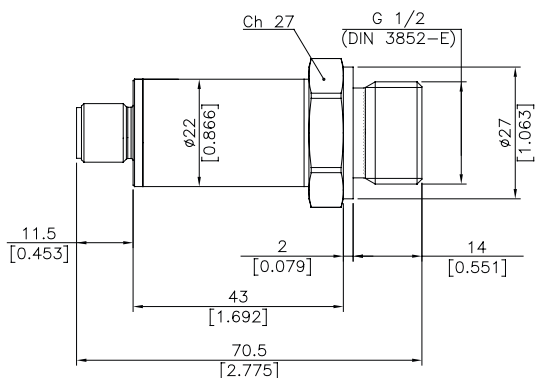
Connector EN 175301-803 Form C



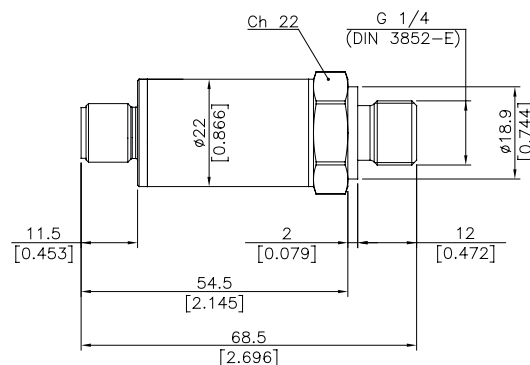
Connector EN 175301-803 Form C



Connector M12x1

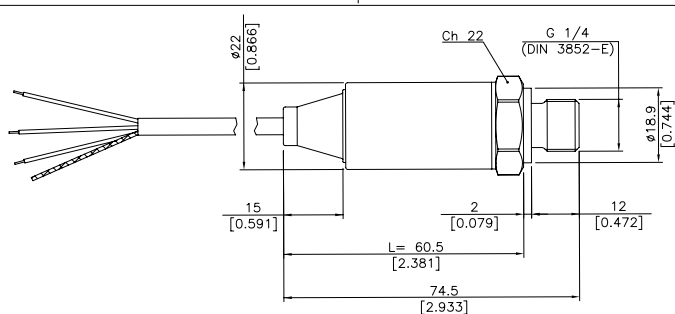


Connector M12x1



Cable output

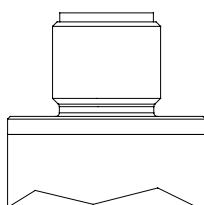
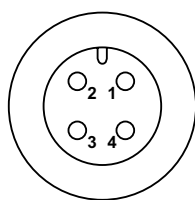
3 Pole cable



Dimensions in mm. [inches]

ELECTRICAL CONNECTION - Connectors

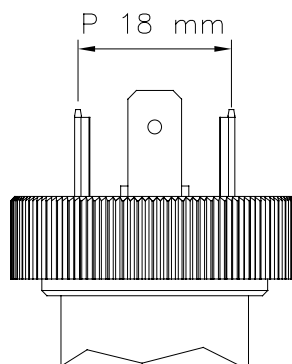
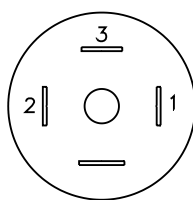
Z – 4 pin male connector M12 x 1*



4 pin
male connector
Protection IP67

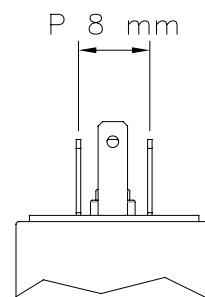
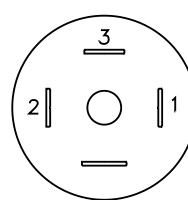
* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strength threadlocker

E - EN 175301-803



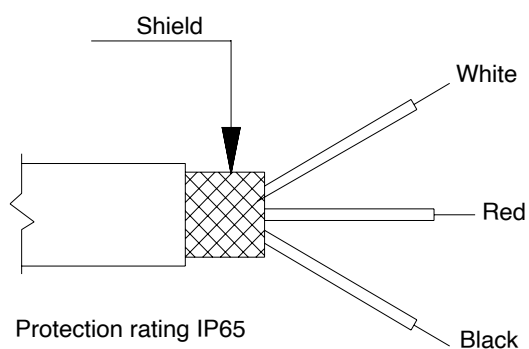
4 pin DIN
Form A
Protection IP65

C – EN 175301-803



4 pin MicroDIN
Form C
Protection IP65

F – 3 pole cable Shielded cable 3x26 AWG - Length 1 m



ELECTRICAL CONNECTION – RATINGS

ELECTRICAL CONNECTION	IP RATING	cULus CERTIFIED	TEMPERATURE RATINGS **
F – 2/3 pole cable *	IP65		-10+105°C
Z - 4 pole male connector M12 x 1	IP67	X	-40+105 °C
E - 4 pole solenoid connector EN 175301-803-A	IP65	X	-40+105 °C
C - 4 pole microsolenoid connector EN 175301-803-C	IP65	X	-40+105 °C

*UL certified version not available.

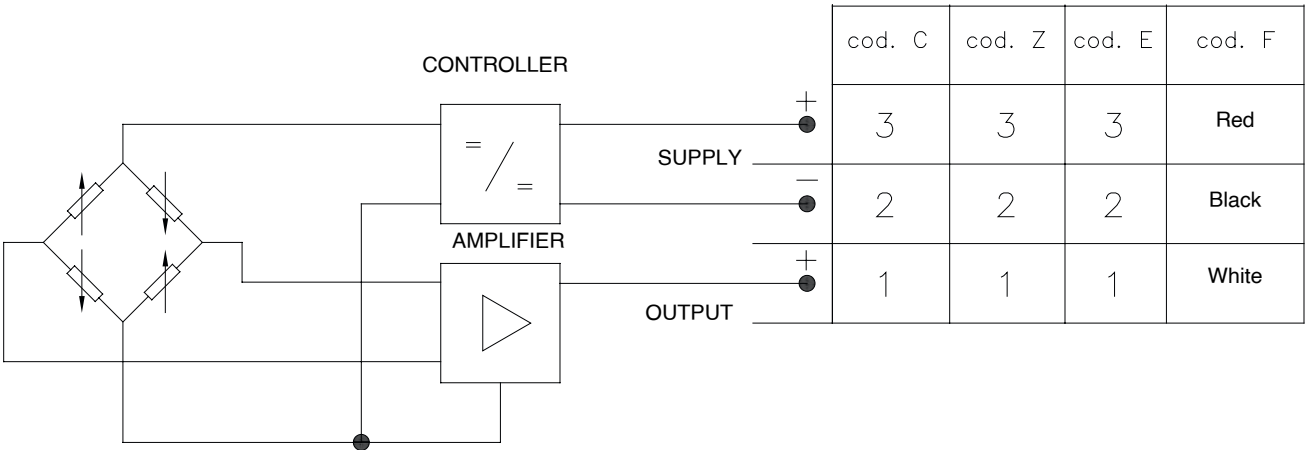
** The operating temperature ranges, except where expressly indicated, are also applicable in the UL scope.

Notes:

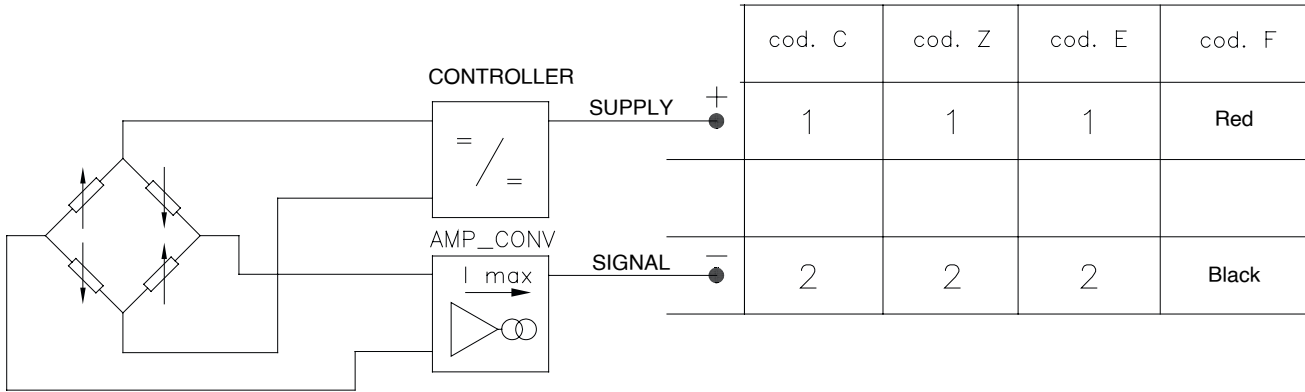
1. The IP rating specified in this document normally applies with the suitable female connector plugged-in and properly wired.
2. The pressure transducers with measuring range of 60 bar and below require vented cable and/or mating connector, to allow the compensation of the atmospheric pressure reference.

ELECTRICAL CONNECTION - Connection diagrams

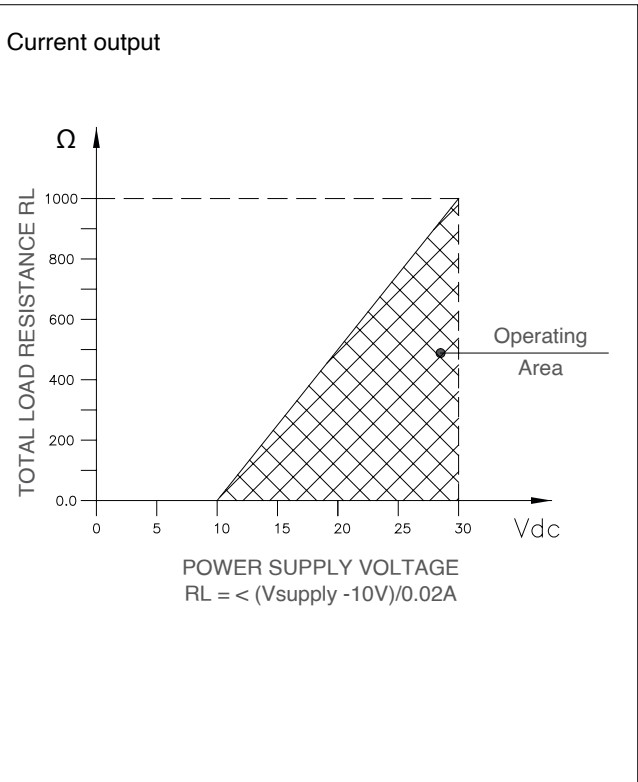
VOLTAGE AMPLIFIED OUTPUT



CURRENT AMPLIFIED OUTPUT - mod. E



LOAD DIAGRAM



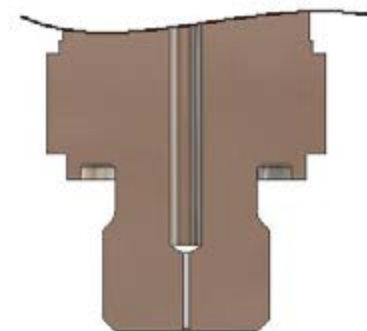
PRESSURE PEAKS PROTECTION

Many industrial applications, especially in hydraulics, could present dangerous phenomena like cavitation, liquid hammer or pressure peaks, due for example to pumps start and stop or fast closing of a valve.

These phenomena can be harmful to the transducer.

The KS series, upon request, is available with an integrated pressure snubber which, thanks to a 0.5 mm diameter through hole, eliminates these harmful peaks, to protect the transducer.

Contact Gefran to request the version with pressure snubber.



SIL CERTIFICATION (Safety Integrity Level) – FUNCTIONAL SAFETY

Safety is a critical requirement especially for machine builders. The new European Directive 2006/42/EC defines all the essential requirements in this regard.

In the context of functional safety, the European directive is received by the technical standard **IEC / EN 62061** "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems"(SRECS)

KS pressure transmitters are certified SIL CL 2 by the Certification Body TÜV Rheinland with Test Report No.FS 28712235, in accordance with that rule, for use in applications "High Demand Mode" and then may be used in SRECS systems of machinery, where the safety variable to control will be the pressure of a fluid.

- NOTES:**
- 1) The SIL certification is supplied standard, and is available for pressure ranges from 0 ... 4 bar and above
 - 2) For models with voltage amplified output, SIL certification is only available for versions with output at atmospheric pressure greater than zero volts (ie: 0.1 ... 10.1 V)
 - 3) Full specifications and installation and user manual of KS certified SIL 2 can be downloaded directly from the website www.gefran.com

ACCESSORIES ON REQUEST

MATING CONNECTORS

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **
Connection E EN 175301-803 4 pin DIN Form A (P 18) - H=32	IP65	CON064	X	-40+125 °C -40+65°C (cULus)
		CON113	X	-40+90°C
Connection E 3 pole connector + ground EN 175301-803-A H28	IP65	CON045	X	-40+125 °C -40+65°C (cULus)
		CON114	X	-40+90°C
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	IP65	CON047		-40+125 °C
		CON116	X	-40+90°C
Connection Z 4 pole female cable connector M12x1	IP67	CON293		-25+85°C
		CON087	X	-25+90°C
Connection Z 4 pole female cable connector, 90° M12x1	IP67	CON050		-25+85°C
		CON088	X	-25+90°C

EXTENSION CABLES*

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **	CABLE COLOR CODE	
					Pin	Wire
Connection Z female connector M12x1 + 2/3/5/10m of cable	* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker	CAV220	X	-30+80°C	1	Brown
		CAV221			2	White
		CAV222			3	Blue
		CAV223			4	Black

* Other lengths on request

** The nominal temperature ranges, except where expressly indicated, are also applicable in the UL scope.

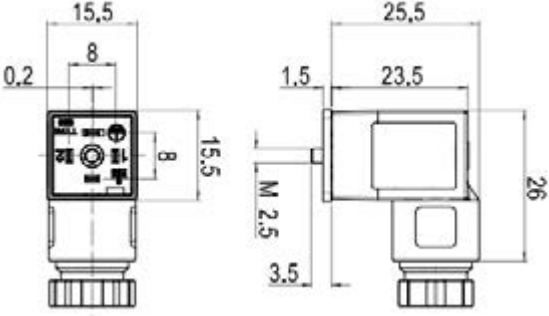
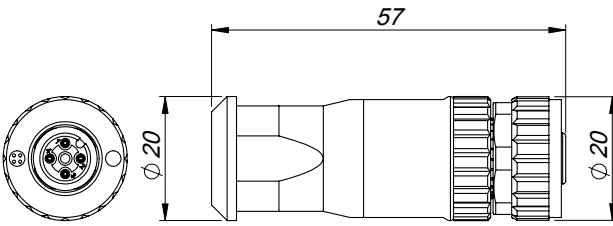
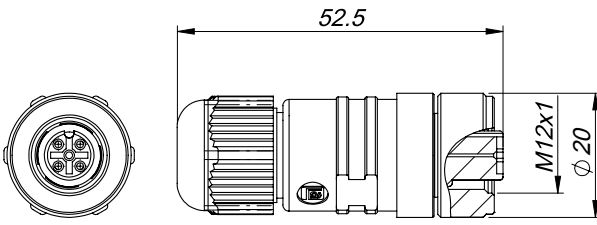
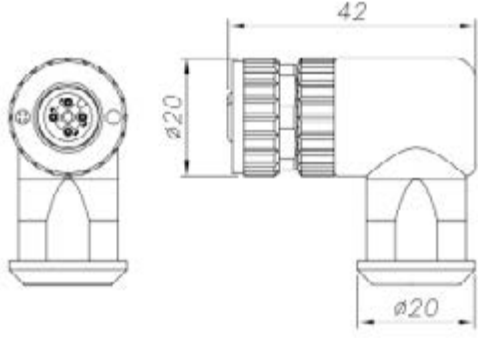
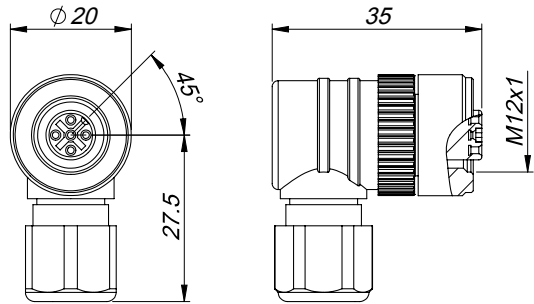
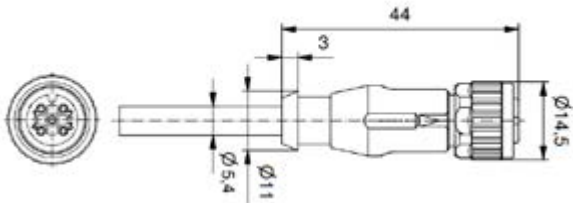
For cULus applications extension cables, a 3 pole 26AWG Style 2464 cable is advised

SEALING CODE ACCORDING TO PROCESS CONNECTION

PROCESS CONNECTION	STEEL + NBR	NBR	FKM
G 1/4 gas male DIN E			GUA036
G 1/2 gas male DIN E		GUA380	
M12x1,5			GUA166
G 1/4 gas male DIN A	RON300		
M14x1,5			GUA036
M10x1			GUA385
G3/8			GUA190
G1/8			GUA385
7/16-20 UNF		GUA175	

ACCESSORIES DRAWINGS

DESCRIPTION	CODE	DRAWING
Connection E EN 175301-803 4 pin DIN Form A (P 18) H=32	CON064	
	CON113	
Connection E 3 pole connector + ground EN 175301-803-A H=28	CON045	
	CON114	
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON047	

DESCRIPTION	CODE	DRAWING
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON116	
Connection Z 4 pole female cable connector M12x1	CON293	
	CON087	
Connection Z 4 pole female cable connector, 90° M12x1	CON050	
	CON088	
Connection Z female connector M12x1 + 2/3/5/10m of cable	CAV220	
	CAV221	
	CAV222	
	CAV223	

ORDERING INFORMATION

Pressure transmitter

KS

□ □ □ □ □ □ M V □

2130 x □ x 00

000=vers. standard

00U=vers. cULus listed

OUTPUT SIGNAL

0.1...5.1 Vdc	B
0.1...10.1 Vdc	C
4...20 mA	E
0...5 Vdc	M*
0...10 Vdc	N*
1...5 Vdc	P
1...6 Vdc	R
1...10 Vdc	Q
0.2...10.2 Vdc	T
0.5...4.5 Vdc	X
* SIL Certification not available	

PRESSURE CONNECTIONS

G 1/4 gas male (DIN 3852-E)	E
G 1/2 gas male (DIN 3852-E)	3

ELECTRICAL CONNECTIONS

4-pin connector microDIN (P8)	C
4 pin connector M12x1	Z
4-pin connector DIN (P18)	E
2/3 pole shielded cable (1m)	F(*)

(*) UL certification not available

NOTE: - cULus listed version is available on request (see ordering information)

- Available on request different types of output signal, pressure connections and electrical connections. Please consult Factory.

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

RESPONSE TIME

V Fast (< 1 msec)

NON-LINEARITY

M ± 0,25% FS BFSL

MEASUREMENT RANGE

	bar		bar
B01U	1*	B04D	40
B1V6	1.6*	B06D	60
B02U	2*	B01C	100
B2V5	2.5*	B16D	160
B04U	4	B02C	200
B06U	6	B25D	250
B01D	10	B04C	400
B16U	16	B06C	600
B02D	20	B01M	1000
B25U	25		
*SIL and UL certification not available			

CALIBRATION STANDARDS

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

Ex: KS - E - E - C - B04C - M - V

Pressure transmitter KS with 4 to 20 mA output signal, G1/4 male (DIN 3852-E) pressure connection, microDIN electrical connector, 0...400 bar pressure range, ± 0.25% FS non-linearity, 1 msec response time.

Sensors are manufactured in compliance with: - EMC 2014/30/EU Compatibility Directive
- RoHS 2011/65/EU Directive
- 2006/42/EC Machinery Directive

Electrical installation requirements and Conformity certificate are available on our web site: www.gefran.com

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

GEFRAN spa

via Sebina, 74

25050 PROVAGLIO D'ISEO (BS) - ITALIA

tel. 0309888.1 - fax. 0309839063

Internet: <http://www.gefran.com>

GEFRAN

DTS_KS-SIL2_07-2021_ENG



This symbol present on the product label stands for further indications on product manual. For correct and safe installation, follow the instructions and observe the warnings contained in this manual. No hazards shall arise by any reasonably foreseeable misuse in a way not intended, and not described in this manual. The complete manual is available for download from the website www.gefran.com.
UL file number E216851

Main Features

- **Ranges:** from 1 to 1000 bar
- **Nominal Output Signal:**
4...20mA (2 wires)
0...10Vdc / 0.1...5.1Vdc / 0.1...10.1Vdc / 0...5Vdc /
1...5Vdc / 1...6Vdc / 1...10Vdc / 0.2...10.2Vdc (3 wires)
0.5...4.5Vdc (3 wires - ratiometric)
- **Compact size**
- **Wetted parts:** Stainless steel
- **SIL 2 certified according to IEC/EN 62061:2005**

KS transmitters are based on film sensing element deposited on stainless steel diaphragm.

Thanks to the latest state of the art SMD electronics and compact all stainless steel construction, these products are extremely robust and reliable, with SIL2 certification supplied as standard.

KS transmitters are suitable for all industrial applications, specially on hydraulics (presses, pumps, power pack, fluid power, etc.) with severe conditions usually with high level of shock, vibration, and pressure and temperature peaks.

TECHNICAL DATA

Output signal	VOLTAGE		RATIOMETRIC	CURRENT
Non Linearity (BFSL)	± 0.15% FS (typ) ± 0.25% FS (max)			
Hysteresis	+ 0.1% FS (typ) + 0.15% FS (max)			
Repeatability	± 0.025% FS (typ) ± 0.05% FS (max)			
Zero offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Span offset tolerance	± 0.15% FS (typ) ± 0.25% FS (max)			
Accuracy at room temperature (1)	< ± 0.5% FS			
Pressure ranges (2)	From 1 bar to 1000 bar (See table)			
Resolution	Infinite			
Overpressure (without degrading performance)	See table			
Pressure containment (burst test)	See table			
Pressure Media	Fluids compatible with Stainless Steel AISI 430F and 17-4 PH			
Housing	Stainless Steel AISI 304			
Power supply (4)	B/M/P R N/C/T/Q	10...30Vdc 11...30Vdc 15...30Vdc	5Vdc ± 0,25V	10...30Vdc
Max current absorption	15mA			35mA
Dielectric strenght	250 Vdc			
Zero output signal	B/M/P/R/N/C/T/Q		0.5Vdc (X)	4 mA (E)
Full scale output signal	B/M/P/R/N/C/T/Q		4.5Vdc (X)	20 mA (E)
Allowed load	≥ 5KΩ			see load diagram
Long term stability	< 0.2% FS/per year			
Operating temperature range (process)	-40...+125°C (-40...+257°F)			
Operating temperature range (ambient) (5)	-40...+105°C (-40...+221°F)			
Compensated temperature range	-20...+85°C (-4...+185°F)			
Storage temperature range	-40...+125°C (-40...+257°F)			
Temperature effects over compensated range (zero)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Temperature effects over compensated range (span)	± 0.01% FS/°C typ. (± 0.02% FS/°C max.)			
Response time (10...90%FS)	< 1 msec.			
Warm-up time (3)	< 30 sec.			
Mounting position effects	Negligible			
Humidity	Up to 100%RH non-condensing			
Weight	80-120 gr. nominal			
Mechanical shock	100g/11msec according to IEC 60068-2-27			
Vibrations	20g max at 10...2000 Hz according to IEC 60068-2-6			
Ingress protection	IP65/IP67 (M12 version) with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker			
Output short circuit and reverse polarity protection	YES			
EC Conformity	According to Directive 2014/30/EU			

FS = Full scale

1 Incl. Non-Linearity, Hysteresis, Repeatability, Zero-offset and Span-offset (acc. to IEC 61298-2)

2 The operating pressure range is intended from 0.5% to 100% FS

3 Time within which the rated performance is achieved

4 The devices must be supplied with a Class 2 Power Supply (as for NEC) or LPS Power Supply (as for EN 60950). If devices are permanently connected to the machine it's requested an external switch or circuit breaker and external overcurrent protection.

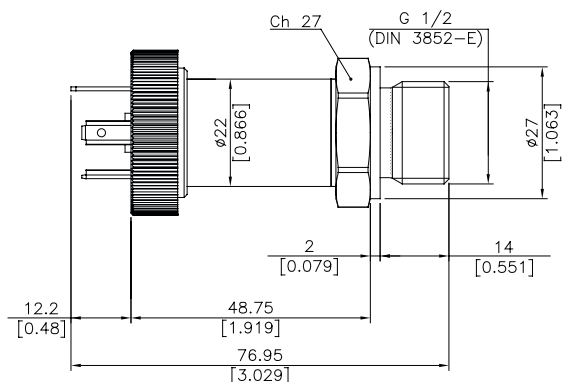
5 See possible restrictions in the paragraphs "Electrical connections" and "Accessories on request".

PRESSURE RANGES

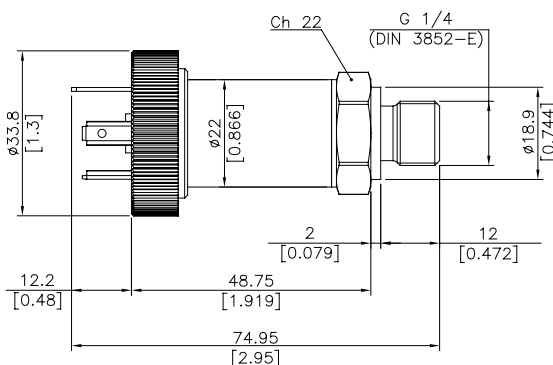
RANGE (Bar)	1	1.6	2	2.5	4	6	10	16	20	25	40	60	100	160	200	250	400	600	1000
Overpressure (Bar)	6	6	6	10	8	12	20	32	40	50	80	120	200	320	400	500	800	1200	1200
Burst pressure (Bar)	9	9	9	15	16	24	40	64	80	100	160	240	400	640	800	1000	1500	1500	1500

INSTALLATION DRAWINGS

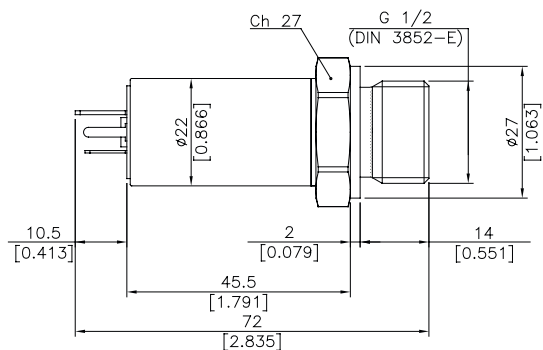
Connector EN 175301-803 Form A



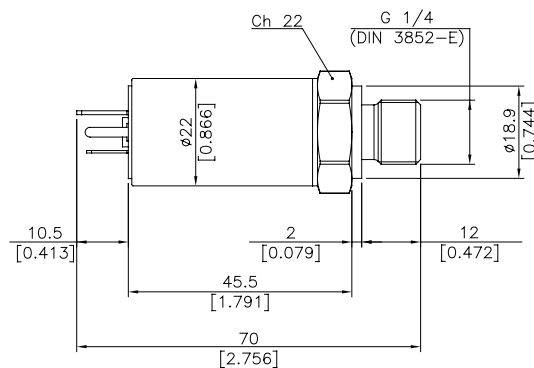
Connector EN 175301-803 Form A



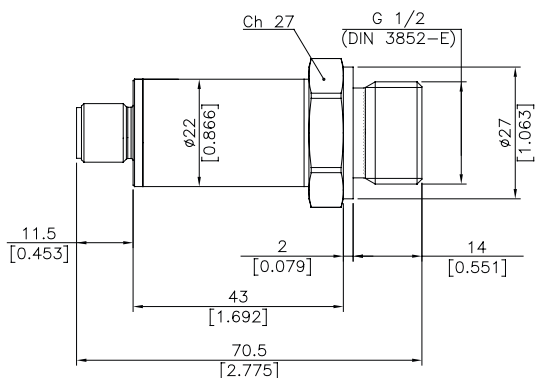
Connector EN 175301-803 Form C



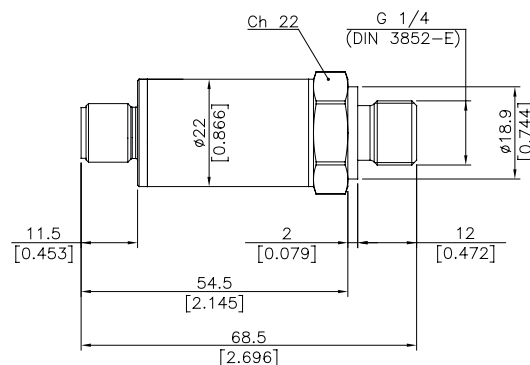
Connector EN 175301-803 Form C



Connector M12x1

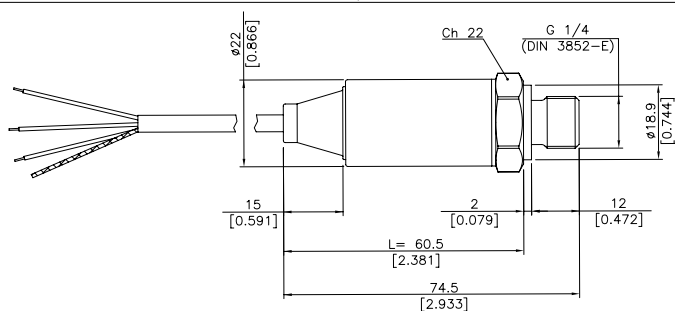


Connector M12x1



Cable output

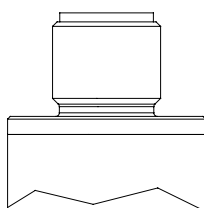
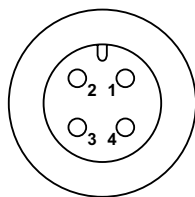
3 Pole cable



Dimensions in mm. [inches]

ELECTRICAL CONNECTION - Connectors

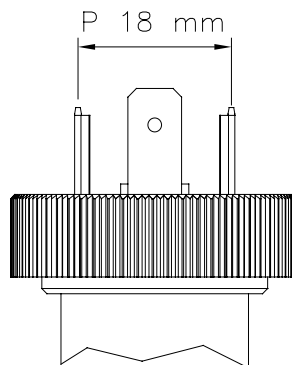
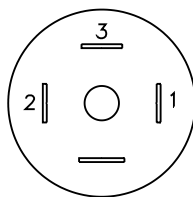
Z – 4 pin male connector M12 x 1*



4 pin
male connector
Protection IP67

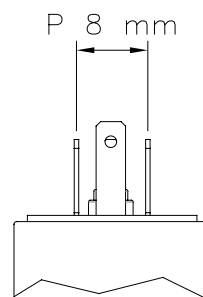
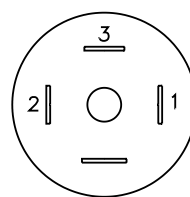
* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strength threadlocker

E - EN 175301-803



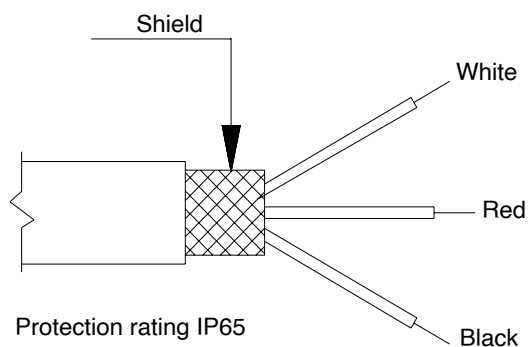
4 pin DIN
Form A
Protection IP65

C – EN 175301-803



4 pin MicroDIN
Form C
Protection IP65

F – 3 pole cable Shielded cable 3x26 AWG - Length 1 m



ELECTRICAL CONNECTION – RATINGS

ELECTRICAL CONNECTION	IP RATING	cULus CERTIFIED	TEMPERATURE RATINGS **
F – 2/3 pole cable *	IP65		-10+105°C
Z - 4 pole male connector M12 x 1	IP67	X	-40+105 °C
E - 4 pole solenoid connector EN 175301-803-A	IP65	X	-40+105 °C
C - 4 pole microsolenoid connector EN 175301-803-C	IP65	X	-40+105 °C

*UL certified version not available.

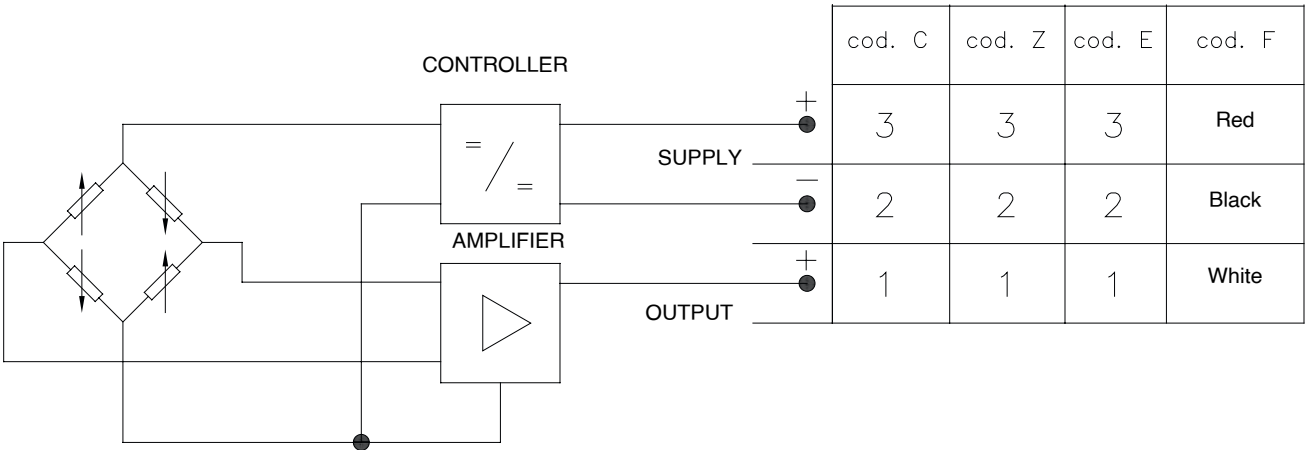
** The operating temperature ranges, except where expressly indicated, are also applicable in the UL scope.

Notes:

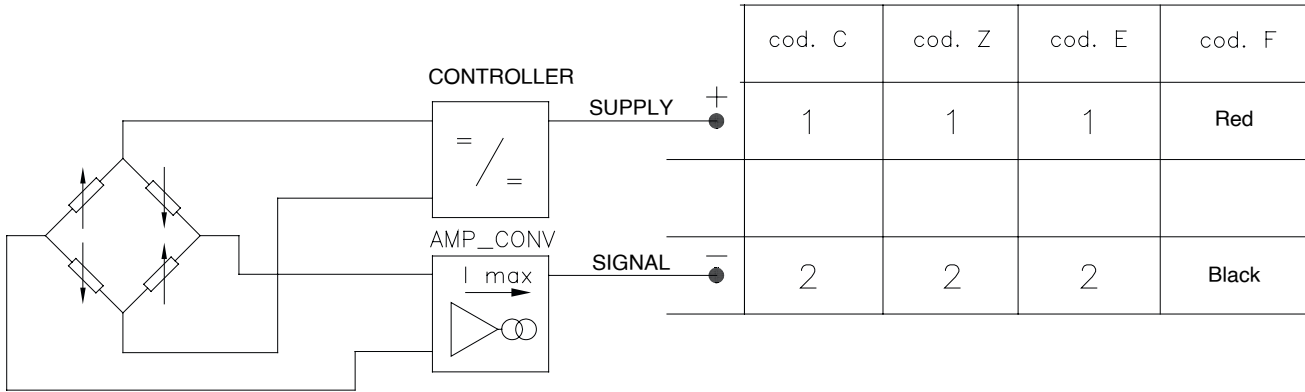
1. The IP rating specified in this document normally applies with the suitable female connector plugged-in and properly wired.
2. The pressure transducers with measuring range of 60 bar and below require vented cable and/or mating connector, to allow the compensation of the atmospheric pressure reference.

ELECTRICAL CONNECTION - Connection diagrams

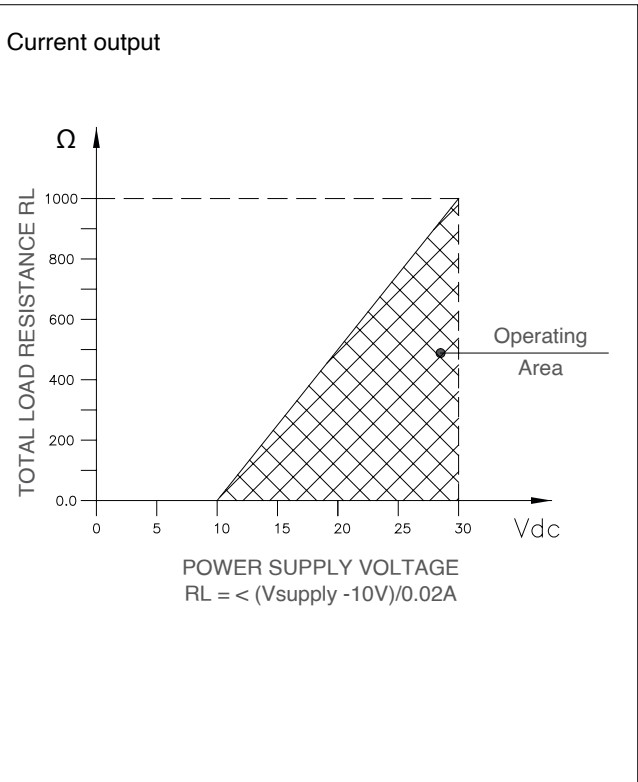
VOLTAGE AMPLIFIED OUTPUT



CURRENT AMPLIFIED OUTPUT - mod. E



LOAD DIAGRAM

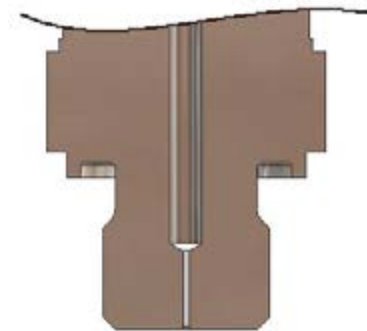


PRESSURE PEAKS PROTECTION

Many industrial applications, especially in hydraulics, could present dangerous phenomena like cavitation, liquid hammer or pressure peaks, due for example to pumps start and stop or fast closing of a valve. These phenomena can be harmful to the transducer.

The KS series, upon request, is available with an integrated pressure snubber which, thanks to a 0.5 mm diameter through hole, eliminates these harmful peaks, to protect the transducer.

Contact Gefran to request the version with pressure snubber.



SIL CERTIFICATION (Safety Integrity Level) – FUNCTIONAL SAFETY

Safety is a critical requirement especially for machine builders. The new European Directive 2006/42/EC defines all the essential requirements in this regard.

In the context of functional safety, the European directive is received by the technical standard **IEC / EN 62061** "Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems"(SRECS)

KS pressure transmitters are certified SIL CL 2 by the Certification Body TÜV Rheinland with Test Report No.FS 28712235, in accordance with that rule, for use in applications "High Demand Mode" and then may be used in SRECS systems of machinery, where the safety variable to control will be the pressure of a fluid.

- NOTES:**
- 1) The SIL certification is supplied standard, and is available for pressure ranges from 0 ... 4 bar and above
 - 2) For models with voltage amplified output, SIL certification is only available for versions with output at atmospheric pressure greater than zero volts (ie: 0.1 ... 10.1 V)
 - 3) Full specifications and installation and user manual of KS certified SIL 2 can be downloaded directly from the website www.gefran.com

ACCESSORIES ON REQUEST

MATING CONNECTORS

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **
Connection E EN 175301-803 4 pin DIN Form A (P 18) - H=32	IP65	CON064	X	-40+125 °C -40+65°C (cULus)
		CON113	X	-40+90°C
Connection E 3 pole connector + ground EN 175301-803-A H28	IP65	CON045	X	-40+125 °C -40+65°C (cULus)
		CON114	X	-40+90°C
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	IP65	CON047		-40+125 °C
		CON116	X	-40+90°C
Connection Z 4 pole female cable connector M12x1	IP67	CON293		-25+85°C
		CON087	X	-25+90°C
Connection Z 4 pole female cable connector, 90° M12x1	IP67	CON050		-25+85°C
		CON088	X	-25+90°C

EXTENSION CABLES*

DESCRIPTION	IP RATING	CODE	cULus CERTIFIED	TEMPERATURE RATINGS **	CABLE COLOR CODE	
					Pin	Wire
Connection Z female connector M12x1 + 2/3/5/10m of cable	* IP67 with female homologated connector mounted, tightening torque 0.6Nm + low strenght threadlocker	CAV220	X	-30+80°C	1	Brown
		CAV221			2	White
		CAV222			3	Blue
		CAV223			4	Black

* Other lengths on request

** The nominal temperature ranges, except where expressly indicated, are also applicable in the UL scope.

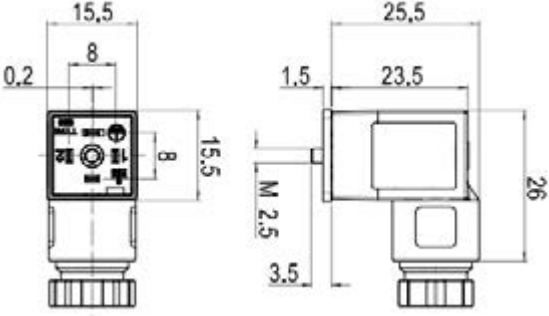
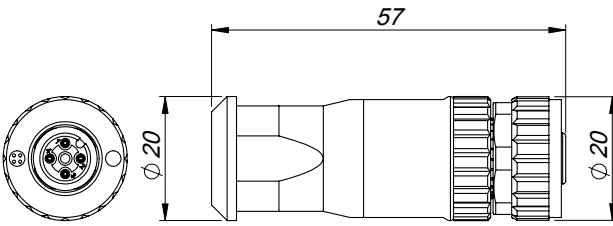
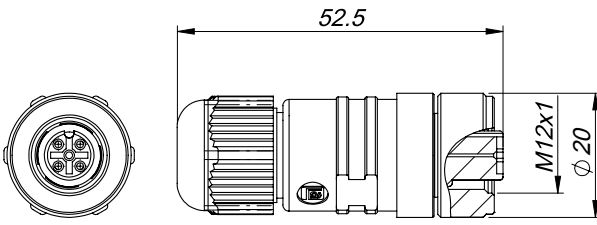
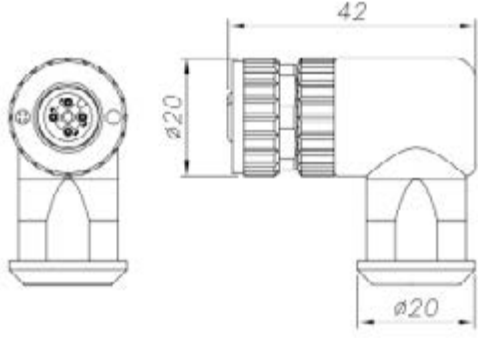
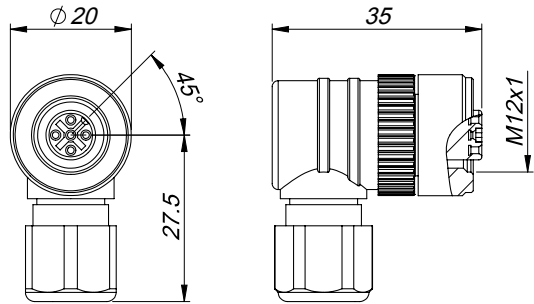
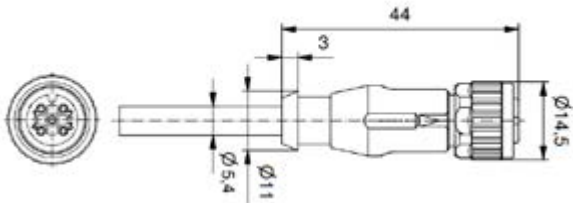
For cULus applications extension cables, a 3 pole 26AWG Style 2464 cable is advised

SEALING CODE ACCORDING TO PROCESS CONNECTION

PROCESS CONNECTION	STEEL + NBR	NBR	FKM
G 1/4 gas male DIN E			GUA036
G 1/2 gas male DIN E		GUA380	
M12x1,5			GUA166
G 1/4 gas male DIN A	RON300		
M14x1,5			GUA036
M10x1			GUA385
G3/8			GUA190
G1/8			GUA385
7/16-20 UNF		GUA175	

ACCESSORIES DRAWINGS

DESCRIPTION	CODE	DRAWING
Connection E EN 175301-803 4 pin DIN Form A (P 18) H=32	CON064	
	CON113	
Connection E 3 pole connector + ground EN 175301-803-A H=28	CON045	
	CON114	
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON047	

DESCRIPTION	CODE	DRAWING
Connection C EN 175301-803 4 pin MicroDIN Form C (P 8)	CON116	
Connection Z 4 pole female cable connector M12x1	CON293	
	CON087	
Connection Z 4 pole female cable connector, 90° M12x1	CON050	
	CON088	
Connection Z female connector M12x1 + 2/3/5/10m of cable	CAV220	
	CAV221	
	CAV222	
	CAV223	

ORDERING INFORMATION

Pressure transmitter

KS

□ □ □ □ □ □ M V □

2130 x □ x 00

000=vers. standard

00U=vers. cULus listed

OUTPUT SIGNAL

0.1...5.1 Vdc	B
0.1...10.1 Vdc	C
4...20 mA	E
0...5 Vdc	M*
0...10 Vdc	N*
1...5 Vdc	P
1...6 Vdc	R
1...10 Vdc	Q
0.2...10.2 Vdc	T
0.5...4.5 Vdc	X
* SIL Certification not available	

PRESSURE CONNECTIONS

G 1/4 gas male (DIN 3852-E)	E
G 1/2 gas male (DIN 3852-E)	3

ELECTRICAL CONNECTIONS

4-pin connector microDIN (P8)	C
4 pin connector M12x1	Z
4-pin connector DIN (P18)	E
2/3 pole shielded cable (1m)	F(*)

(*) UL certification not available

NOTE: - cULus listed version is available on request (see ordering information)

- Available on request different types of output signal, pressure connections and electrical connections. Please consult Factory.

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

RESPONSE TIME

V Fast (< 1 msec)

NON-LINEARITY

M $\pm 0,25\%$ FS BFSL

MEASUREMENT RANGE

	bar		bar
B01U	1*	B04D	40
B1V6	1.6*	B06D	60
B02U	2*	B01C	100
B2V5	2.5*	B16D	160
B04U	4	B02C	200
B06U	6	B25D	250
B01D	10	B04C	400
B16U	16	B06C	600
B02D	20	B01M	1000
B25U	25		

*SIL and UL certification not available

CALIBRATION STANDARDS

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

Ex: KS - E - E - C - B04C - M - V

Pressure transmitter KS with 4 to 20 mA output signal, G1/4 male (DIN 3852-E) pressure connection, microDIN electrical connector, 0...400 bar pressure range, $\pm 0.25\%$ FS non-linearity, 1 msec response time.

Sensors are manufactured in compliance with:

- EMC 2014/30/EU Compatibility Directive
- RoHS 2011/65/EU Directive
- 2006/42/EC Machinery Directive

Electrical installation requirements and Conformity certificate are available on our web site: www.gefran.com

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice.

GEFRAN spa

via Sebina, 74

25050 PROVAGLIO D'ISEO (BS) - ITALIA

tel. 0309888.1 - fax. 0309839063

Internet: <http://www.gefran.com>

GEFRAN

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