



#### Main Features

- Ranges: from 4 to 1000 bar
- Nominal Output Signal:  
0...10Vdc (3 wires) / 4...20mA (2 wires)  
0.5...4.5 v ratiometric
- Compact size
- Wetted parts: Stainless steel
- SIL 2 certified according to IEC/EN 62061:2005

KH 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.

KH 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, pressure and temperature peaks, as typical for mobile machines environment.

#### TECHNICAL DATA

	VOLTAGE	RATIOMETRIC	CURRENT
Output signal			
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 4 bar to 1000 bar (See table)		
Overvoltage	32 Vdc max		
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	15...30Vdc	5V ±0.25 V	10...30Vdc
Dielectric strenght	250 Vdc		
Zero output signal	0 V (N); 0.1 V (C)	0.5 V (X)	4 mA (E)
Full scale output signal	10 V (N); 10.1 V (C)	4.5 V (X)	20 mA (E)
Allowed load	≥ 5KΩ		see load diagram
Long term stability	< 0.2% FSO/per year		
Operating temperature range (process)	-40...+125°C (-40...+257°F)		
Operating temperature range (ambient)	-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%FSO)	< 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		
Output short circuit and reverse polarity protection	YES		
CE Conformity	According to EC Directive 2004/108/CE		

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

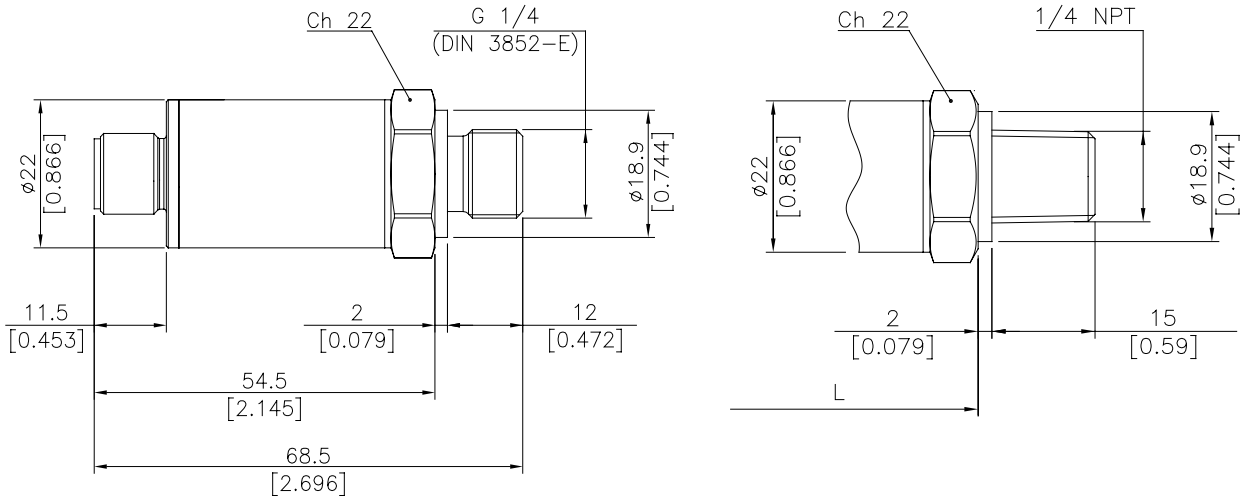
3 Time within which the rated performance is achieved

## PRESSURE RANGES

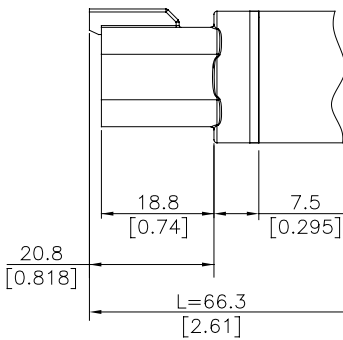
RANGE (Bar)	4	6	10	16	20	25	40	60	100	160	200	250	400	600	1000
Overpressure (Bar)	8	12	20	32	40	50	80	120	200	320	400	500	800	1200	1200
Burst pressure (Bar)	16	24	40	64	80	100	160	240	400	640	800	1000	1500	1500	1500

## MECHANICAL DIMENSIONS

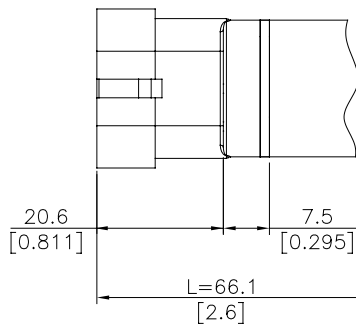
### Z - Connector M12x1



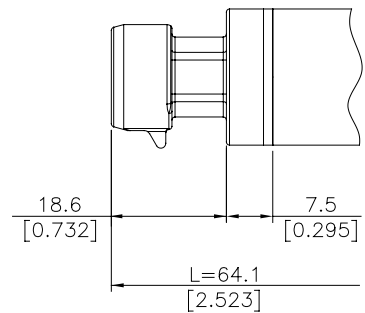
### G - Connector Deutsch DT04-4P (4-pin)



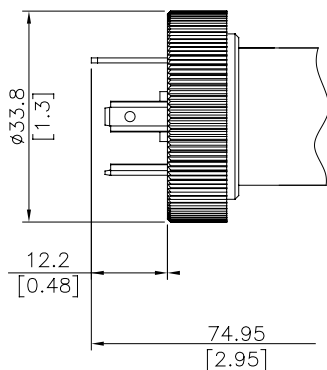
### S - Connector AMP Superseal 1.5 (3-pin)



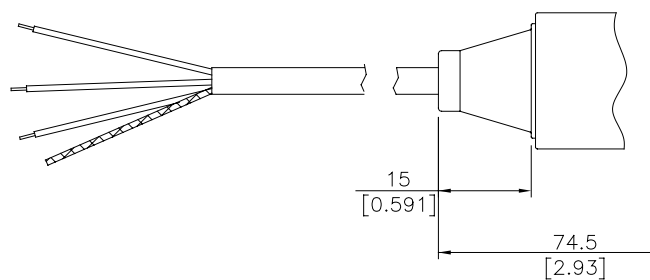
### K - Connector Metri-Pack 150 (3-pin)



### E - Connector EN 175301-803 type A (4-pin)



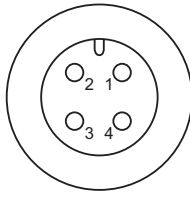
### F - 3 Pole cable Shielded cable TPE-O $\phi$ 4.2 mm 3 x 26 AWG - Length 1 m



Dimensions in mm. [inches]

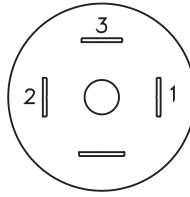
## ELECTRICAL CONNECTION - Connectors

**Z - M12 x 1 (4 pin)**



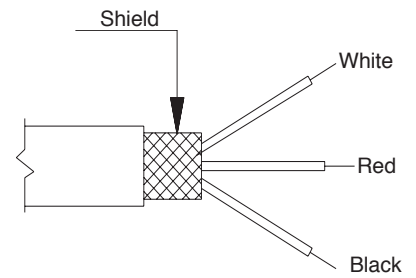
Protection rating IP67

**E - EN 175301-803**



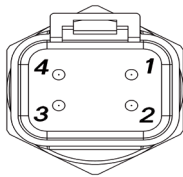
Protection rating IP65

**F - 3 pole cable**



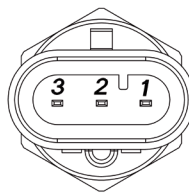
Protection rating IP65

**G - Deutsch DT04-4P**



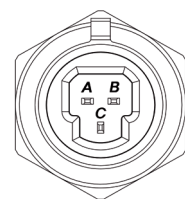
Protection rating IP67

**S - AMP Superseal 1.5**



Protection rating IP67

**K - Metri-Pack 150**



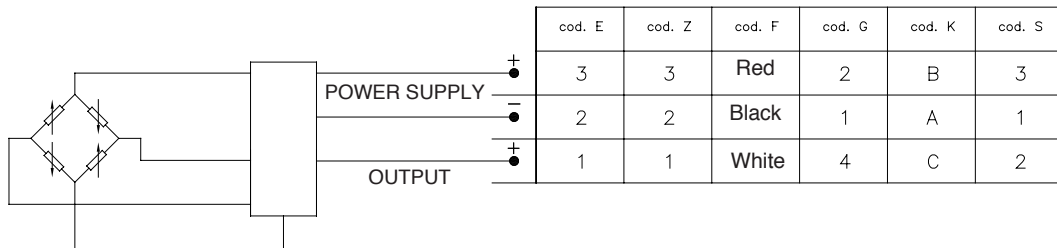
Protection rating IP67

**Notes:**

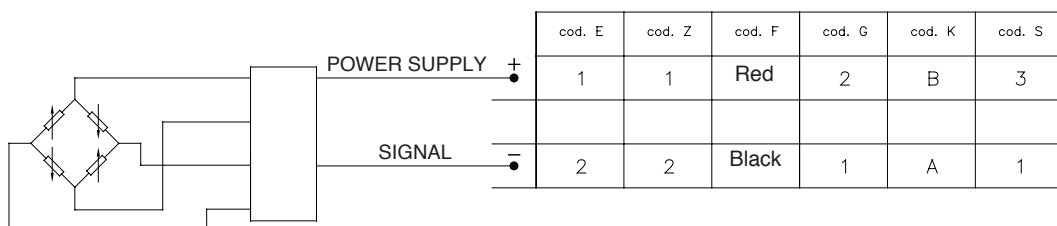
1. The IP rating specified in this document normally applies with the suitable female connector plugged-in and properly wired.
2. The pressure transducers with measuring range of 60 bar and below require vented cable and/or mating connector, to allow the compensation of the atmospheric pressure reference.

## ELECTRICAL CONNECTION - Connection diagrams

### RATIOMETRIC AND VOLTAGE AMPLIFIED OUTPUT

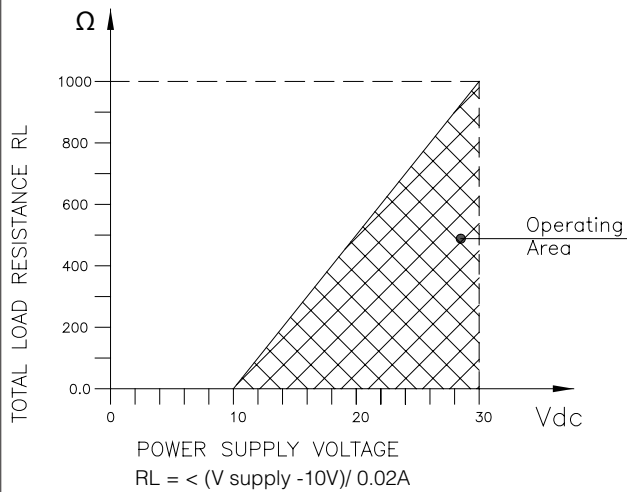


### CURRENT AMPLIFIED OUTPUT - mod. E



## LOAD DIAGRAM

### Current output

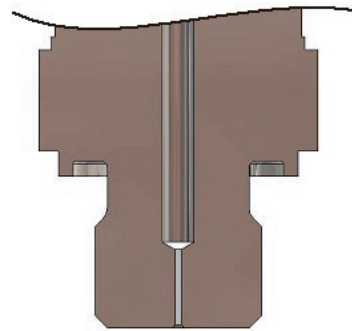


## PRESSURE PEAKS PROTECTION

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 KH 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).

KH pressure transmitters are certified SIL CL 2 by the Certification Body TÜV Rheinland 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) 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)
- 2) Full specifications and installation and user manual of KH certified SIL 2 can be downloaded directly from the website [www.gefran.com](http://www.gefran.com)

## ACCESSORIES ON REQUEST

### Connectors Plugs

#### Connection E

EN 175301-803 4 pin DIN Type A (P 18) - Prot. IP65

**CON 064**

#### Connection Z

4 pin connector M12 x 1 - Prot. IP67

**CON 293**

## EXTENSION CABLES

IP67 female connector M12 x 1 + 2 m of cable  
 IP67 female connector M12 x 1 + 3 m of cable  
 IP67 female connector M12 x 1 + 5 m of cable  
 IP67 female connector M12 x 1 + 10 m of cable

**CAV220**  
**CAV221**  
**CAV222**  
**CAV223**

Cable color code	
Pin	Wire
1	Brown
2	White
3	Blue
4	Black

## ORDERING INFORMATION

Pressure transmitter

**KH**

OUTPUT SIGNAL	
0.1...10.1 Vdc	<b>C</b>
4...20 mA	<b>E</b>
0.5...4.5 V ratiometric	<b>X</b>
0...10 Vdc	<b>N*</b>

\* SIL Certification not available  
 Available on request other voltage outputs

PRESSURE CONNECTION	
G 1/4 gas male (DIN 3852-E)	<b>E</b>
1/4-18 NPT male	<b>7</b>

Available on request other pressure connections

ELECTRICAL CONNECTIONS	
EN 175301-803 type A	<b>E</b>
M12x1 (4-pin)	<b>Z</b>
Shielded cable (1 m) *	<b>F</b>
Deutsch DT04-4P (4-pin)	<b>G</b>
AMP Superseal 1.5 (3-pin)	<b>S</b>
Metri-Pack 150 (3-pin)	<b>K</b>

\* Available on request different lengths of cable

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

RESPONSE TIME	
<b>V</b>	Fast (< 1 msec)

NON-LINEARITY	
<b>M</b>	± 0.25% FS

MEASUREMENT RANGE			
	bar		bar
<b>B04U</b>	4	<b>B06D</b>	60
<b>B06U</b>	6	<b>B01C</b>	100
<b>B01D</b>	10	<b>B16D</b>	160
<b>B16U</b>	16	<b>B02C</b>	200
<b>B02D</b>	20	<b>B25D</b>	250
<b>B25U</b>	25	<b>B04C</b>	400
<b>B04D</b>	40	<b>B06C</b>	600
		<b>B01M</b>	1000

### CALIBRATION STANDARDS

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

**Ex: KH - X - E - G - B04C - M - V**

Pressure transmitter KH with 0.5...4.5V ratiometric output signal, G1/4 male (DIN 3852-E) pressure connection, Deutsch DT04-4P electrical connector, 0...400 bar pressure range, ± 0.25% Non-Linearity, 1 msec response time.

Sensors are manufactured in compliance with: - EMC 2004/108/CE Compatibility Directive  
 - RoHS 2002/95/CE Directive  
 - 2006/42/CE Machinery Directive

Electrical installation requirements and Conformity certificate are available on our web site: [www.gefran.com](http://www.gefran.com)

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

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**GEFRAN**

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