GEFRAN

KH

PRESSURE TRANSMITTER

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 stanless 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

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 tolarance
± 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

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

EC Conformity
According to Directive 2014/30/EU

Output signal	VOLTAGE	RATIOMETRIC	CURRENT
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

FS = Full scale

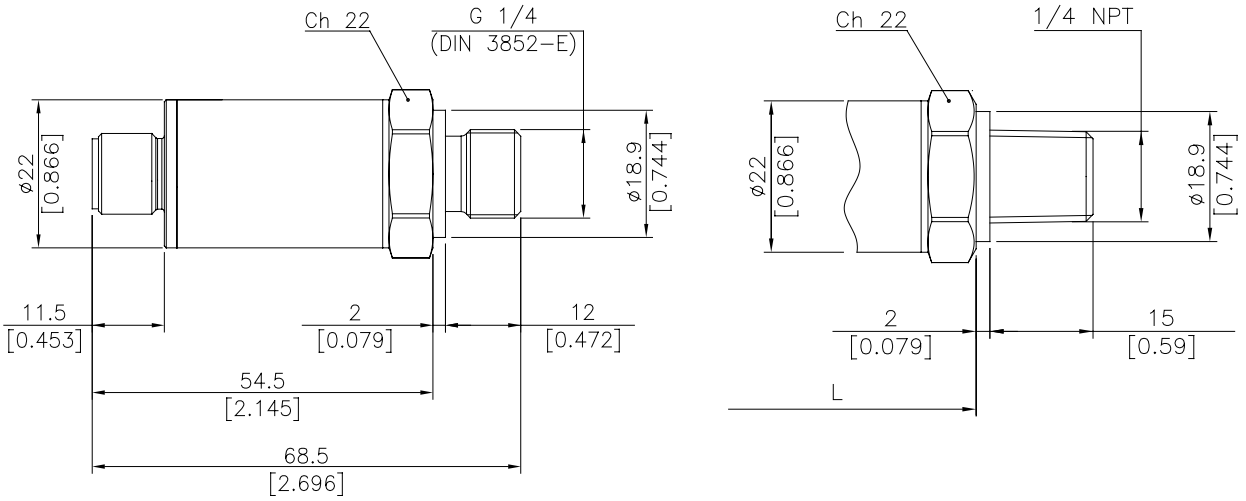
1) Incl. Non-Linearity, Hysteresis, Repeatability, Zero-offset and Span-offset tolerance (acc. to IEC 61298-2)
2) The operating pressure range is intended from 0.5 to 100% FS
3) Time within which the rated performance ia achieved

PRESSURE RANGES

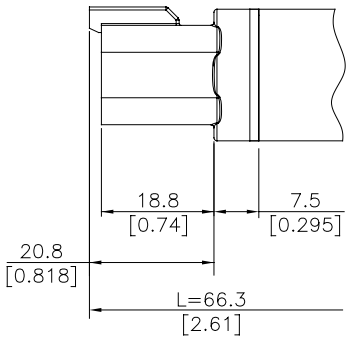
RANGE (Bar)	4	6	10	16	20	25	40	60	100	160	200	250	400	600	1000
Overpressure (Bar)	8	12	20	32	40	50	80	120	200	320	400	500	800	1200	1200
Burst pressure (Bar)	16	24	40	64	80	100	160	240	400	640	800	1000	1500	1500	1500

MECHANICAL DIMENSIONS

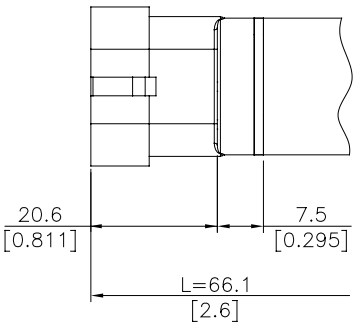
Z - Connector M12x1



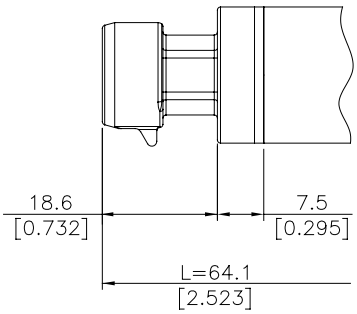
G - Connector Deutsch DT04-4P (4-pin)



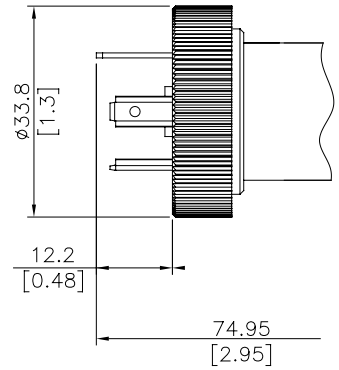
S - Connector AMP Superseal 1.5 (3-pin)



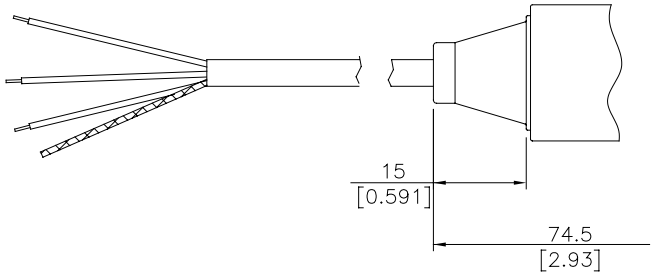
K - Connector Metri-Pack 150 (3-pin)



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



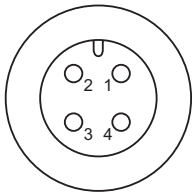
F – 3 Pole cable Shielded cable TPE-O Ø 4.2 mm 3 x 26 AWG – Length 1 m



Dimensions in mm. [inches]

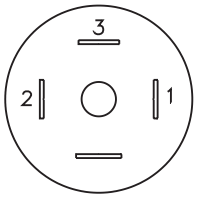
ELECTRICAL CONNECTION - Connectors

Z - M12 x 1 (4 pin)



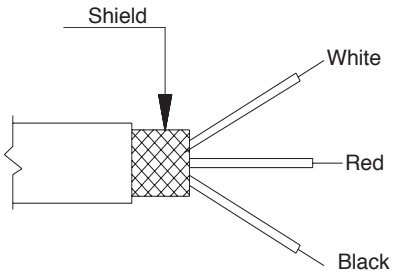
Protection rating IP67

E - EN 175301-803



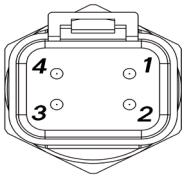
Protection rating IP65

F – 3 pole cable



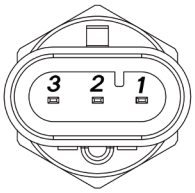
Protection rating IP65

G – Deutsch DT04-4P



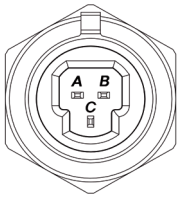
Protection rating IP67

S – AMP Superseal 1.5



Protection rating IP67

K – Metri-Pack 150



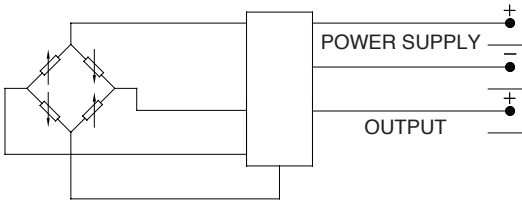
Protection rating IP67

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.

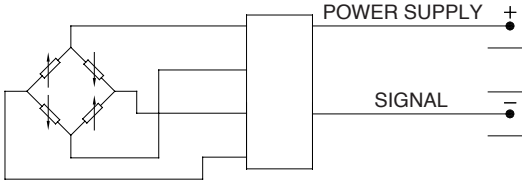
ELECTRICAL CONNECTION - Connection diagrams

RATIOMETRIC AND VOLTAGE AMPLIFIED OUTPUT



cod. E	cod. Z	cod. F	cod. G	cod. K	cod. S
3	3	Red	2	B	3
2	2	Black	1	A	1
1	1	White	4	C	2

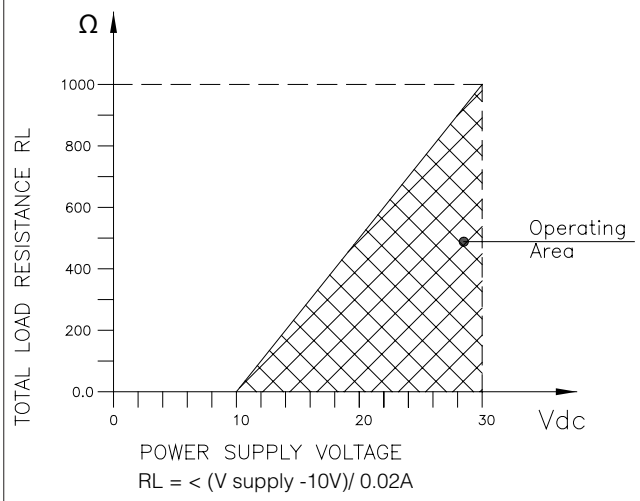
CURRENT AMPLIFIED OUTPUT – mod. E



cod. E	cod. Z	cod. F	cod. G	cod. K	cod. S
1	1	Red	2	B	3
2	2	Black	1	A	1

LOAD DIAGRAM

Current output

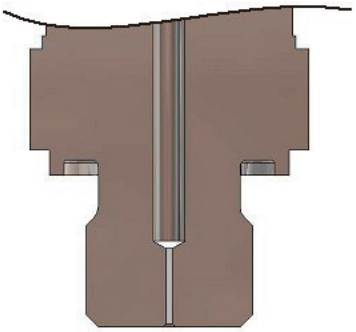


PRESSURE PEAKS PROTECTION

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

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	**CAV220**
IP67 female connector M12 x 1 + 3 m of cable	**CAV221**
IP67 female connector M12 x 1 + 5 m of cable	**CAV222**
IP67 female connector M12 x 1 + 10 m of cable	**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	**C**
4...20 mA	**E**
0.5...4.5 V ratiometric	**X**
0...10 Vdc	**N ***

* SIL Certification not available

Available on request other voltage outputs

PRESSURE CONNECTION	
G 1/4 gas male (DIN 3852-E)	**E**
¼-18 NPT male	**7**

Available on request other pressure connections

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

* Available on request different lengths of cable

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

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

CALIBRATION STANDARDS

Instruments manufactured by Gefran are calibrated against precision pressure calibration equipment wich 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 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

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