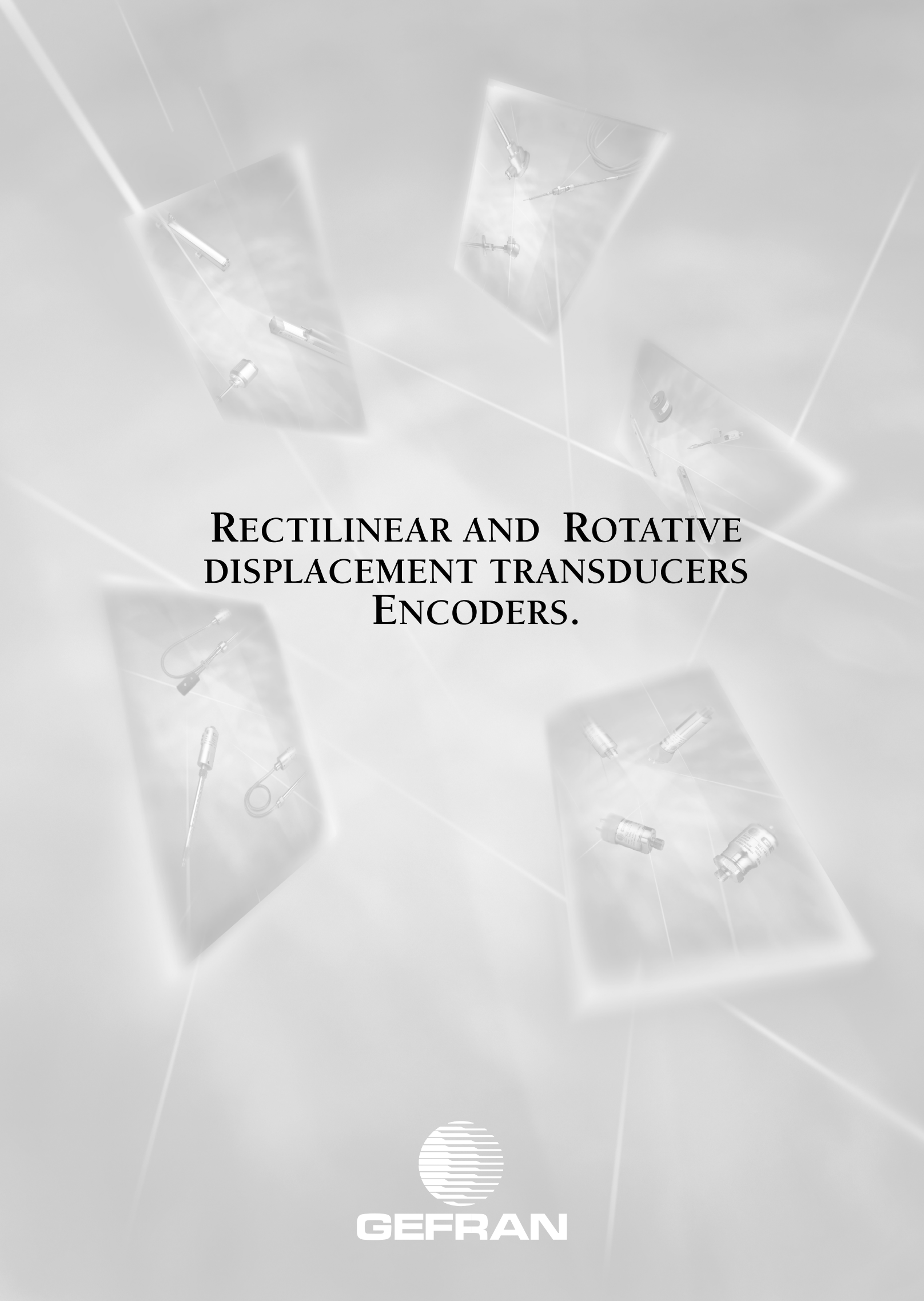


RECTILINEAR AND ROTATIVE DISPLACEMENT TRANSDUCERS ENCODERS.

GEFRAN

CONTENTS

RECTILINEAR AND ROTATIVE DISPLACEMENT TRANSDUCERS / ENCODERS

LT

RECTILINEAR DISPLACEMENT TRANSDUCER

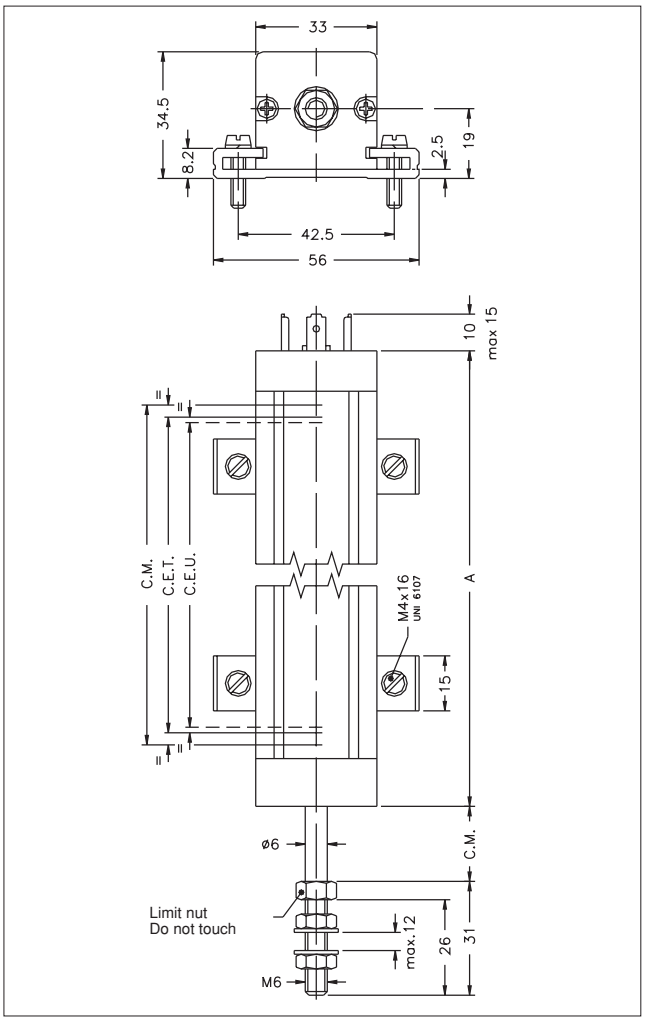
Main features

- *50 to 900 mm stroke.*
- *Mechanical linkage using M6 thread*
- *LIndependent linearity ± 0,05%*
- *Repetibility 0,01 mm.*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed up to 5 m/s (optional 10m/s)*
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  LT H 3 pole connector
  LT M 4 pole connector to standard DIN43650 ISO4400
  LT B 5 pole connector DIN43322
  LT F 3 pole screened cable (1m length).
- *Life duration: > 25x10^6 meters or > 100x10^6 operations whichever is the smaller (within C.E.U.)*
- *Grade of protection IP60 (optional IP65)*

TECHNICAL DATA

Useful electrical stroke (C.E.U.)	50/100/130/150/175/200/225/275/ 300/375/400/450/500/600/750/900
Independent linearity (within C.E.U.)	± 0,05%
Displacement speed	Standard ≤ 5 m/s (optional ≤ 10m/s)
Displacement force	≤ 2N Version IP60 ≤ 10N Version IP65
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Operative acceleration	200 m/s² max (20g)
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	60V
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	3W
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GF 40
Control rod material	Stainless steel AISI 303
Fixing	Brackets with variable longitudinal axis

MECHANICAL DIMENSIONS

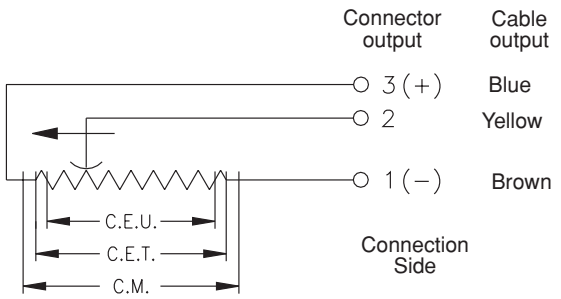


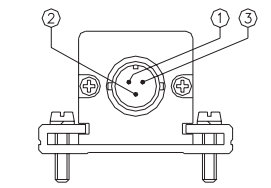
Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

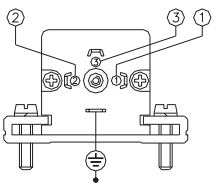
MECHANICAL / ELECTRICAL DATA

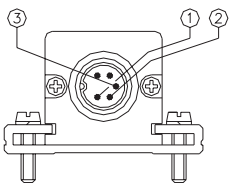
MODEL		50	100	130	150	175	200	225	275	300	375	400	450	500	600	750	900
Useful electrical stroke (C.E.U.) +3/-0	mm	50	100	130	150	175	200	225	275	300	375	400	450	500	600	750	900
Theoretical electrical stroke (C.E.T.) ±1	mm	C.E.U. + 3					C.E.U. + 4				380	406	457	508	609	762	914
Resistance (C.E.T.)	kΩ	5					5				5	5	5	5	5	10	10
Mechanical stroke (C.M.)	mm	C.E.U. + 9					C.E.U. + 10				386	412	463	518	619	772	924
Case length (A)	mm	C.E.U. + 62					C.E.U. + 63				439	465	516	571	672	825	977

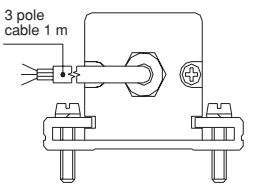
ELECTRICAL CONNECTIONS




LT H output


LT M output


LT B output

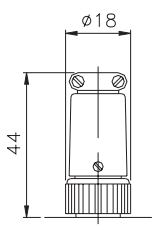


LT F output

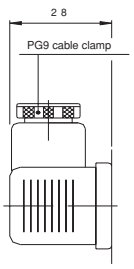
ACCESSORIES

STANDARD ACCESSORIES **Code**

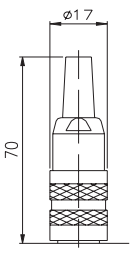
Fixing kit for LT: 2 brackets, screws, grower **PKIT009**



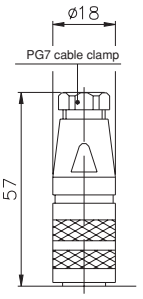
CON002 - IP40 Protection (3 pole Female connector)



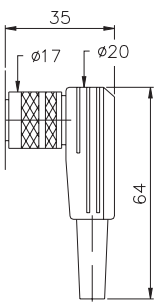
CON006 - IP65 Protection (DIN43650 4 pole Female connector)



CON011- IP40 Prot. (DIN43322 - 5 pole Female conn.)



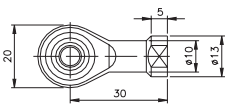
CON012- IP67 Prot. (DIN43322 - 5 pole Female conn.)

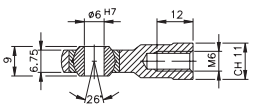


CON013- IP40 Prot. (DIN43322 - 5 pole Female conn.)

Extraction length of the connector 10mm.

Coupling ball-joint **PKIT 015**





ORDER CODE

Displacement transducer **LT**

3 pole connector output	**H**
4 pole connector output DIN43650 ISO4400	**M**
5 pole connector output DIN43322	**B**
3 pole PVC cable output 3x0,25 1m	**F**

Model

Standard version IP60	**S**
Version IP65	**P**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**LT - M - 275 - S**

Displacement transducer model LT, 4 pole connector output DIN 43650 - ISO 4400, useful electrical stroke (C.E.U.) 275mm, standard version IP60.

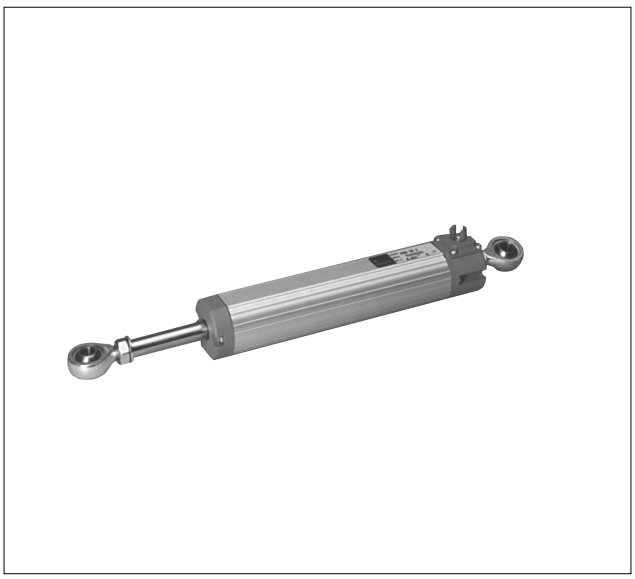
GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

cod. 84857-08/01

PC

SELFLOADING RECTILINEAR DISPLACEMENT TRANSDUCER WITH CYLINDRICAL CASE



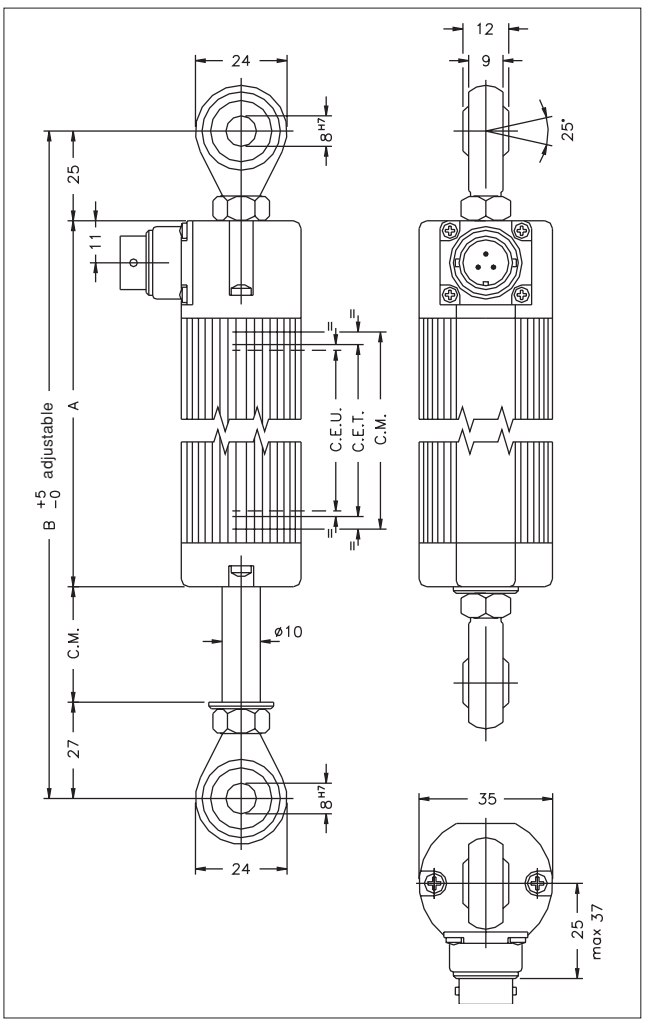
Main features

- *50 to 750 mm. stroke*
- *Mechanical fixing and selfaligning linkage using 2 ball-joints*
- *Maximum angular movement up to ± 30°*
- *Independent linearity ± 0,05%*
- *Repetibility 0,01 mm.*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed up to 5 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  PC H 3-pole connector
  PC M 4-pole connector to standard DIN43650-ISO4400
  PC B 5-pole connector (DIN43322)
  PC F 3-pole screened cable (1 m length)
- *Life duration: > 25x10^6 meters or > 100x10^6 operations, whichever is the smaller (within C.E.U.)*
- *Grade of protection IP65*

TECHNICAL DATA

Useful electrical stroke (C.E.U.)	50/100/130/150/175/200/225/275/ 300/375/400/450/500/600/750
Independent linearity (within C.E.U.)	± 0,05%
Displacement speed	≤ 5 m/s
Displacement force	≤ 10 N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	60V
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectri strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	3W
Temp. Coeffi. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GF 40
Control rod material	Stainless steel AISI 303
Fixing	2 selfloading and selfaligning ball-joints

MECHANICAL DIMENSIONS

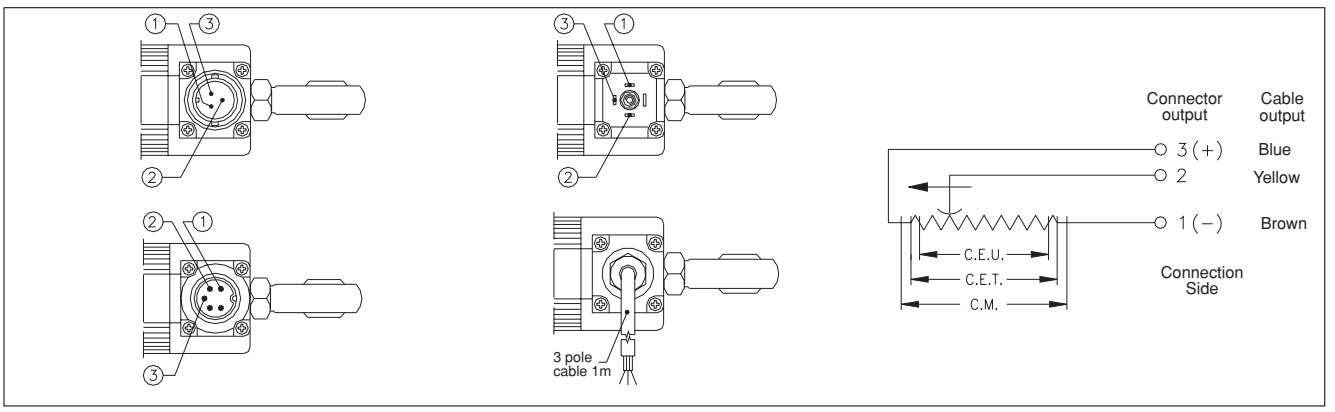


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

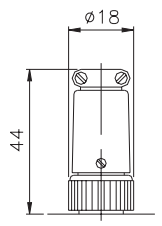
MECHANICAL / ELECTRICAL DATA

MODEL		50	100	130	150	175	200	225	275	300	375	400	450	500	600	750
Useful electrical stroke (C.E.U.) +3/-0	mm	50	100	130	150	175	200	225	275	300	375	400	450	500	600	750
Theoretical electrical stroke (C.E.T.) ± 1	mm	C.E.U. + 3					C.E.U. + 4				380	406	457	508	609	762
Resistance (C.E.T.)	kΩ	5					5				5	5	5	5	5	10
Mechanical stroke (C.M.)	mm	C.E.U. + 9					C.E.U. + 10				386	412	463	518	619	772
Case length (A)	mm	C.E.U. + 129					C.E.U. + 130				512	538	589	664	765	918
Min. distance between ball-joints (B)	mm	C.E.U. + 181					C.E.U. + 182				564	590	641	716	817	970

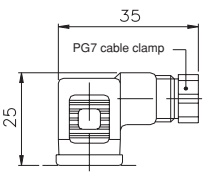
ELECTRICAL CONNECTIONS



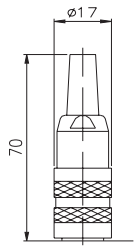
OPTIONAL ACCESSORIES



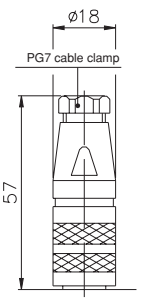
CON002 - IP40 Prot.
(3 Pole Female conn.)



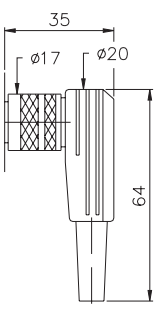
CON008 - IP65 Prot.
(DIN43650 4 pole Female conn.)



CON011 - IP40 Prot.
(DIN43322 5 pole Female conn.)



CON012 - IP67 Prot.
(DIN43322 5 pole Female conn.)



CON013 - IP40 Prot.
(DIN43322 5 pole Female conn.)

Extraction length of the connector 10 mm.

ORDER CODE

Displacement transducer **PC**

3-pole connector output	**H**
4-pole connector output DIN43650 ISO4400	**M**
5-pole connector output DIN45322	**B**
3-pole PVC cable output 3x0,25 1m	**F**

Model

If requested, it is possible to supply models with non-standard mechanical and/or electrical features.

Example:**PC - M - 275**
Displacement transducer model PC,4 pole connector output DIN43650 - ISO 4400, useful electrical stroke (C.E.U.) 275mm.

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

cod.84863-08/01

PK

RODLESS RECTILINEAR DISPLACEMENT TRANSDUCER

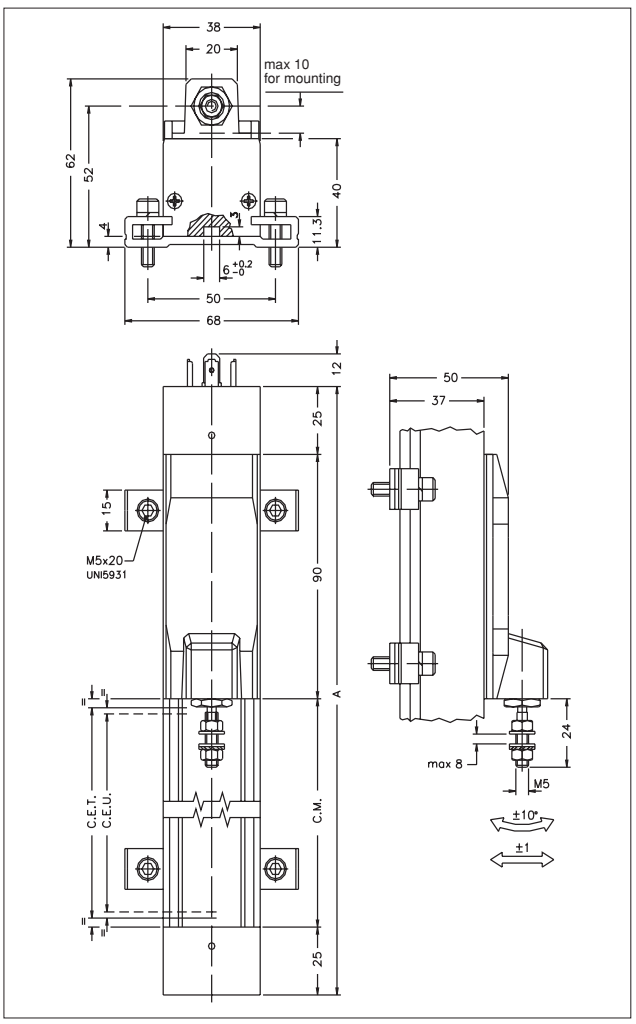
Main features

- *100 to 2000 mm. stroke*
- *Mechanical linkage using joint with take up of play, M5 thread*
- *Independent linearity up to ± 0,05%*
- *Repetibility 0,01 mm.*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed up to:*
  4 m/s PK L version
  10 m/s PK H version
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  PK M 4-pole connector to standard DIN43650 ISO4400
  PK B 5-pole connector (DIN43322)
- *Life duration: > 25x10^6 meters or > 100x10^6 operations, whichever is the smaller (within C.E.U.)*
- *Grade of protection IP40*

TECHNICAL DATA

Useful electrical stroke (C.E.U.)	100/130/150/200/225/300/400/450 500/600/750/900/1000/1250/1500 1750/2000
Independent linearity (within C.E.U.)	± 0,1% from 100 to 400 ± 0,05 from 450 to 2000
Displacement speed	≤ 4 m/s PK L - ≤ 10m/s PK H
Displacement force	≤ 1.2 N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Acceleration operative	200 m/s^2 max (20g)
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	60V
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	3W
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GF 40
Cursor block material	Nylon 66 GF 40 Latilub 73/13
Fixing	Brackets with variable longitudinal axis

MECHANICAL DIMENSIONS

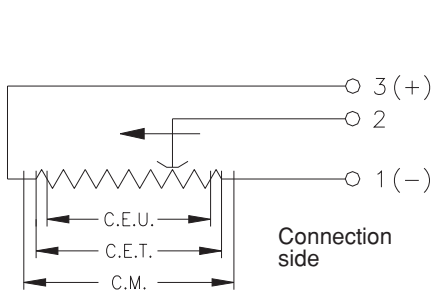


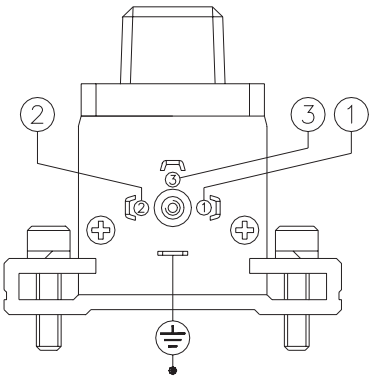
Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

MECHANICAL / ELECTRICAL DATA

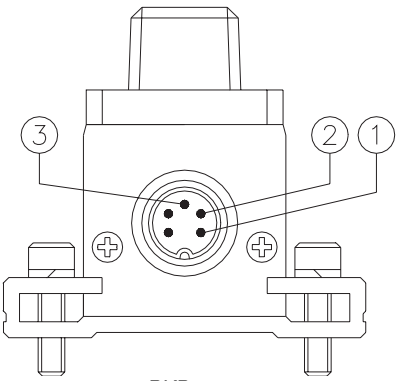
MODEL		100	130	150	200	225	300	400	450	500	600	750	900	1000	1250	1500	1750	2000
Useful electrical stroke (C.E.U.) +3/-0	mm	100	130	150	200	225	300	400	450	500	600	750	900	1000	1250	1500	1750	2000
Theoretical electrical stroke (C.E.T.) ±1	mm	103	133	153	204	229	305	406	458	509	611	763	915	1017	1271	1521	1771	2021
Resistance (C.E.T.)	kΩ	5						10							20			
Mechanical stroke (C.M.)	mm	113	143	163	214	239	315	416	468	519	621	773	925	1027	1281	1531	1781	2031
Case length (A)	mm	253	283	303	354	379	455	556	608	659	761	913	1065	1167	1421	1671	1921	2171

ELECTRICAL CONNECTIONS





PKM output



PKB output

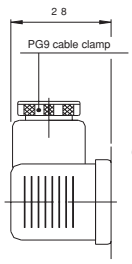
ACCESSORIES

STANDARD ACCESSORIES — **Code**

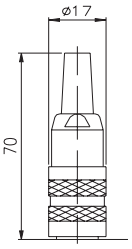
Fixing kit for PK from 100 to 900: 4 brackets, screws, grower — **PKIT010**

Fixing kit for PK from 1000 to 2000: 3 brackets, screws, grower — **PKIT011**

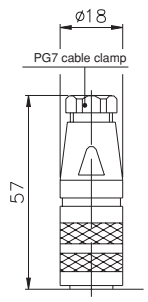
OPTIONAL ACCESSORIES



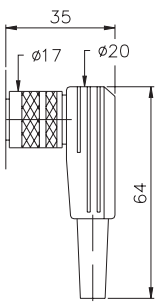
CON006 - IP65 Prot. (DIN43650 - 4 pole Female connector)



CON011 IP40 Prot. (DIN43322 5 pole Female connector)



CON012 - IP67 Prot. (DIN43322 - 5 pole Female connector)



CON013 - IP40 Prot. (DIN43322 - 5 pole Female connector)

Extraction length of the connector 10 mm.

ORDER CODE

Displacement transducer **PK** □ □ □ □

4-pole connector output DIN43650-ISO4400	**M**
5-pole connector output DIN43322	**B**

Model

Displacement speed up to 4m/s	**L**
Displacement speed up to 10m/s	**H**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**PK - M - 275 - L**
Displacement transducer model PK, 4-pole connector output DIN 43650 -9 ISO 4400, useful electrical stroke (C.E.U.) 275mm, displacement speed up to 4 m/s.

GEFRAN

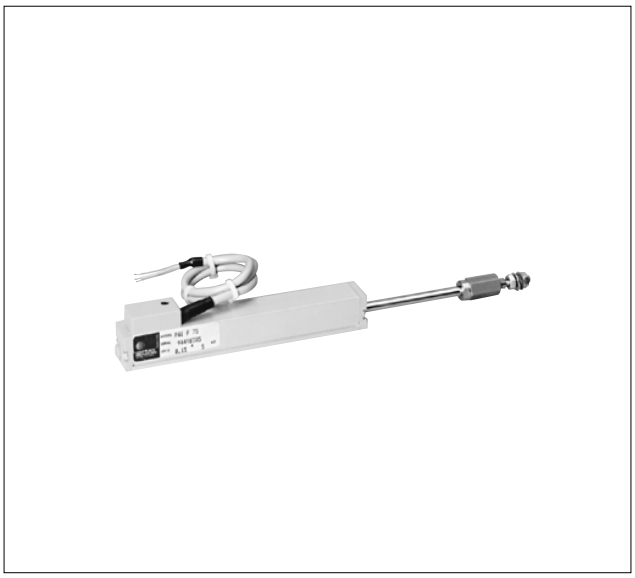
GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

CSQ UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

cod. 84869-08/01

PA1

RECTILINEAR DISPLACEMENT TRANSDUCER



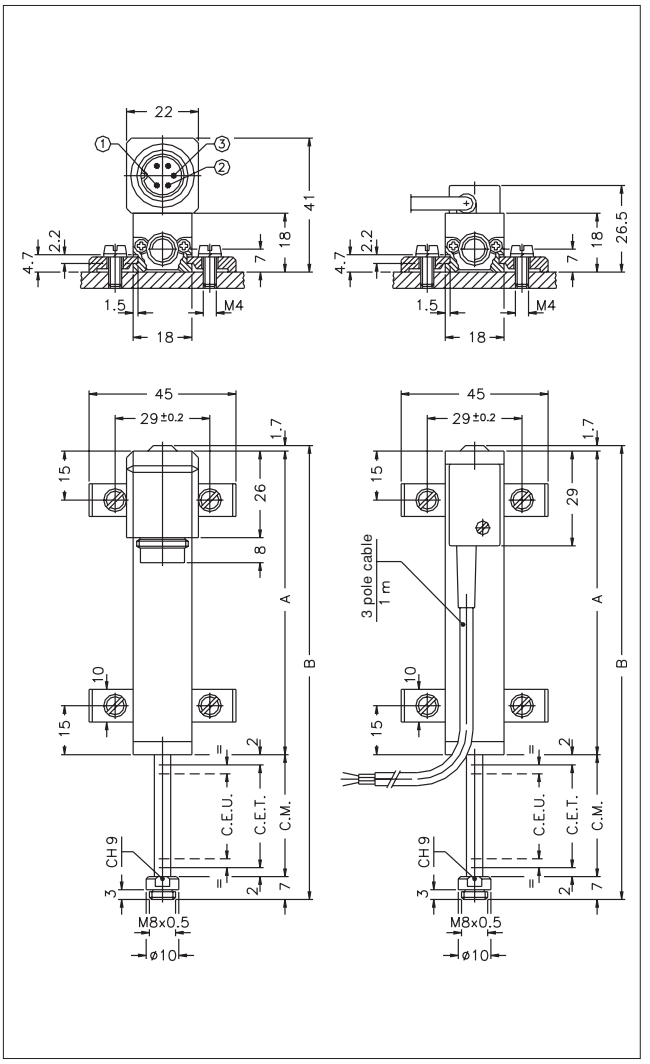
Main features

- *25 to 150 mm stroke.*
- *Mechanical linkage using joint with take up of play, M4 thread*
- *Independent linearity up to ± 0,05%*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed up to 5 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  PA1 F 3 wire 1 m. screened cable
  PA1 C 5 pole connector 1 m. (DIN 43322)
- *Life duration: > 100x10⁶ operations (within C.E.U.)*
- *Grade of protection IP40*

TECHNICAL DATA

Useful electrical stroke (C.E.U.)	25/50/75/100/125/150
Independent linearity (within C.E.U.)	see table
Displacement speed	≤ 5 m/s
Displacement force	≤ 1.2 N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	see table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GV 40
Control rod material	Stainless steel AISI 303
Fixing	Brackets with variable longitudinal axise

MECHANICAL DIMENSIONS

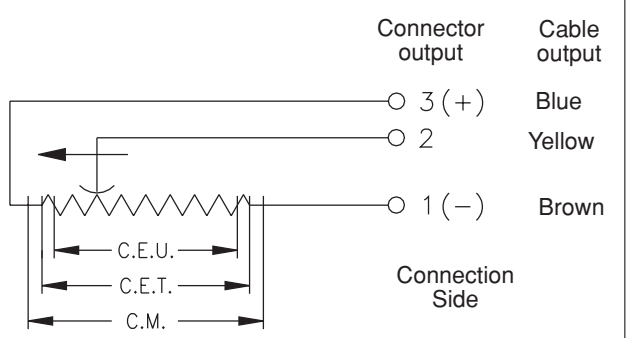


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

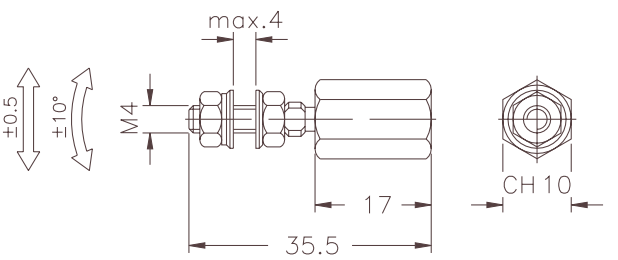
MECHANICAL / ELECTRICAL DATA

MODEL		25	50	75	100	125	150
Useful electrical stroke (C.E.U.) +1/-0	mm	25	50	75	100	125	150
Theoretical electrical stroke (C.E.T.) ±1	mm	C.E.U. +1					
Resistance (sulla C.E.T.)	kΩ	1	5	5	5	5	5
Independent linearity (within C.E.U.)	± %	0,2	0,1	0,1	0,1	0,05	0,05
Dissipation at 40°C (0W at 120°C)	W	0,6	1,2	1,8	2,5	3	3,6
Maximum applicable voltage	V	25	60				
Mechanical stroke (C.M.)	mm	C.E.U. +5					
Case length (A)	mm	C.E.U. +49,5					
Total length (B)	mm	113,2	163,2	213,2	263,2	313,2	363,2

ELECTRICAL CONNECTIONS



COUPLING JOJNT



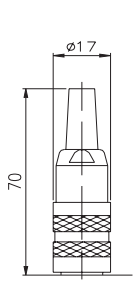
ACCESSORIES

STANDARD ACCESSORIES — **Code**

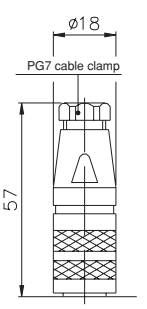
Fixing kit for PA1: 4 brackets, M4x10 screws, grower — **PKIT005**

Coupling joint — **PKIT020**

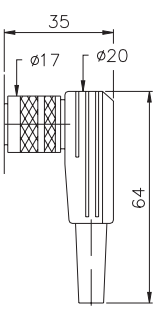
OPTIONAL ACCESSORIES



CON011- IP40 Prot. (DIN43322 - 5 Pole Female connector)



CON012 - IP67 Prot. (DIN43322 - 5 Pole Female connector)



CON013 - IP40 Prot. (DIN43322 - 5 Pole Female connector)

Extraction length of the connector 10mm

ORDER CODE

Displacement transducer **PA1** □ □ □ □

Cable output	**F**
Connector output DIN 43322	**C**

Model

3 pole PVC cable 3x0.25 1m.	**S**
Connector output	**----**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**PA1 - C - 100**
Displacement transducer model PA1, 5 pole connector output, useful electrical stroke (C.E.U.) 100mm

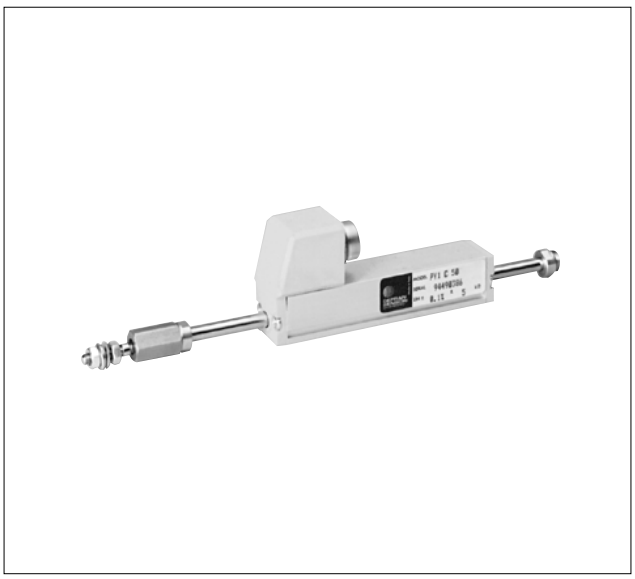
GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

PY1

RECTILINEAR DISPLACEMENT TRANSDUCER



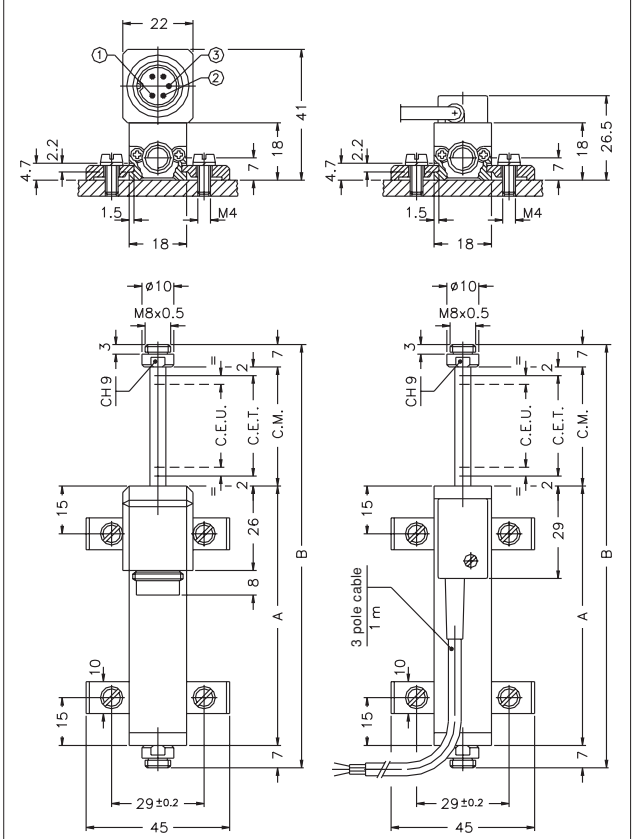
Principali caratteristiche

- *25 to 150 mm. stroke*
- *Mechanical linkage using joint with take up of play, M4 thread*
- *Independent linearity up to ± 0,05%*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed up to 10 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  PY1 F 3 wire 1m screened cable
  PY1 C 5-pole connectors DIN43322
- *Life duration: > 100x10⁶ operations (within C.E.U.)*
- *Double support of the control rod*
- *Grade of protection IP40*

TECHNICAL DATA

Useful electrical stroke (C.E.U.)	25/50/75/100/150
Independent linearity (within C.E.U.)	see table
Displacement speed	≤ 10 m/s
Displacement force	≤ 0.30N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	see table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GF 40
Control rod material	Stainless steel AISI 303
Fixing	Brackets with variable longitudinal axis

MECHANICAL DIMENSIONS

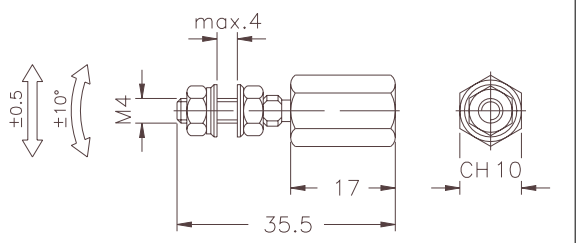


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

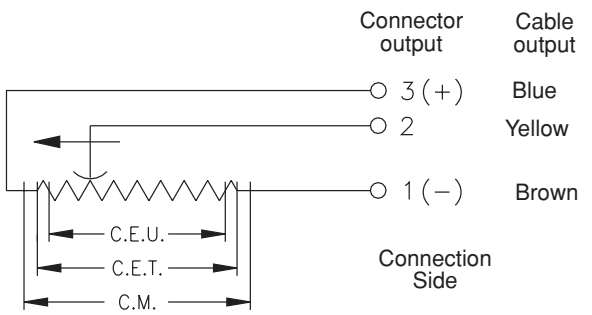
MECHANICAL / ELECTRICAL DATA

MODEL		25	50	75	100	150
Useful electrical stroke (C.E.U.) +3/-0	mm	25	50	75	100	150
Theoretical electrical stroke (C.E.T.) ±1	mm	C.E.U. + 1				
Resistance (C.E.T.)	kΩ	1	5	5	5	5
Independent linearity (within C.E.U.)	± %	0,2	0,1	0,1	0,1	0,05
Dissipation at 40° (0W at 120°C)	W	0,6	1,2	1,8	2,5	3,6
Maximum applicable voltage	V	25	60			
Mechanical stroke (C.M.)	mm	C.E.U. + 5				
Case length (A)	mm	C.E.U. + 38				
Total length (B)	mm	107	157	207	257	357

COUPLING JOINT



ELECTRICAL CONNECTIONS



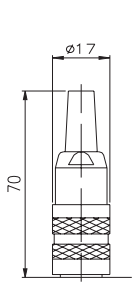
ACCESSORIES

STANDARD ACCESSORIES **Code**

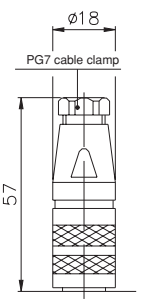
Fixing kit for PY1
4 brackets, M4x10 screws, grower **PKIT005**

Coupling joint **PKIT020**

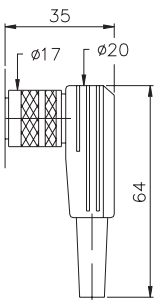
OPTIONAL ACCESSORIES



CON011 - IP40 Prot.
(5 pole Female conn.)



CON012 - IP67 Prot.
(5 pole Female conn.)



CON013 - IP40 Prot.
(5 pole Female conn.)

Extraction length of the connector 10mm.

ORDER CODE

Displacement transducer **PY1** □ □ □ □

Cable output	**F**
Connector output DIN43322	**C**

Model

3-pole PVC cable output 3x0,25 1meter	**S**
Connector output	**----**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**PY1 - C - 100**
Displacement transducer model PY1, 5-pole connector output, useful electrical stroke (C.E.U.) 100mm.

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

cod. 84911-08/01

PY2

RECTILINEAR DISPLACEMENT TRANSDUCER WITH BALL TIP

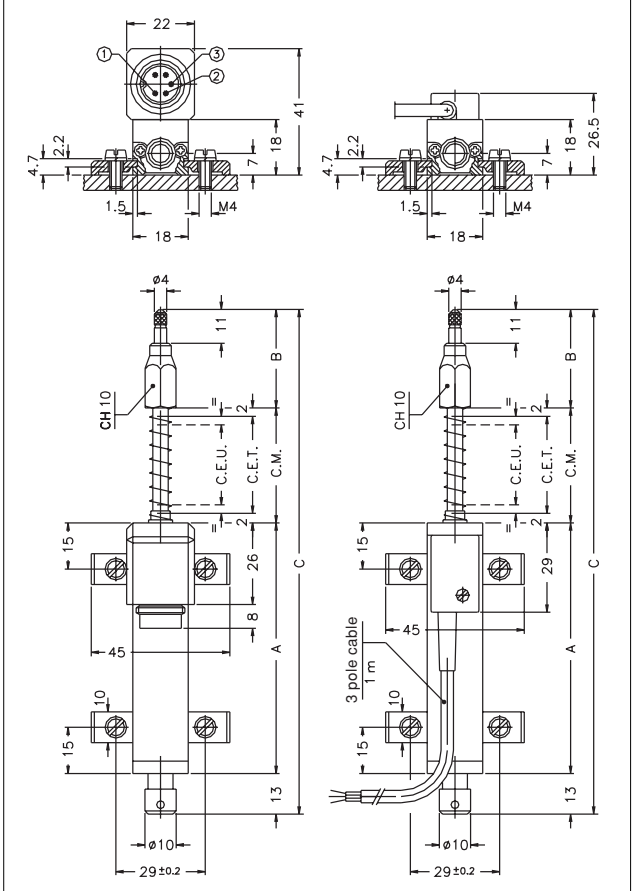
Main features

- *10 to 50 mm. stroke*
- *Double support of the control rod and return spring*
- *Tip with M2.5 thread and stainless steel ball*
- *Independent linearity up to ± 0,1%*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed up to 10 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  PY2 F 3 wire 1m screened cable
  PY2 C 5-pole connector DIN43322
- *Life duration: > 100x10⁶ operations (within C.E.U.)*
- *Grade of protection IP40*

TECHNICAL DATA

Useful electrical stroke (C.E.U.)	10/25/50
Independent linearity (within C.E.U.)	see table
Displacement speed	≤ 10 m/s
Displacement force	≤ 4N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	see table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Strorage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GF 40
Control rod material	Stainless steel AISI 303
Fixing	Brackets with variable longitudinal axis

MECHANICAL DIMENSIONS

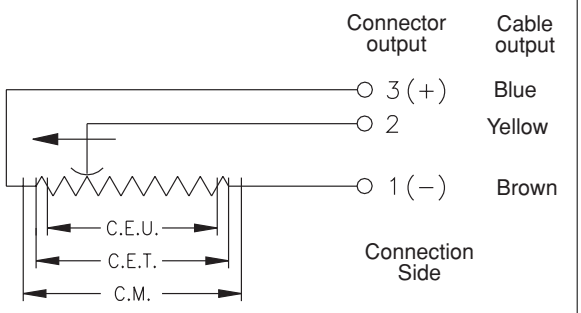


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

MECHANICAL / ELECTRICAL DATA

MODEL		10	25	50
Useful electrical stroke (C.E.U.) +1/-0	mm	10	25	50
Theoretical electrical stroke (C.E.T.) ±1	mm	C.E.U. + 1		
Resistance (C.E.T.)	kΩ	1	1	5
Independent linearity (within C.E.U.)	± %	0,3	0,2	0,1
Dissipation at 40° (0W at 120°C)	W	0,2	0,6	1,2
Maximum applicable voltage	V	14	25	60
Mechanical stroke (C.M.)	mm	C.E.U. + 5		
Case length (A)	mm	C.E.U. + 38		
Tip length (B)	mm	32	32	40
Total length (C)	mm	108	138	196

ELECTRICAL CONNECTIONS



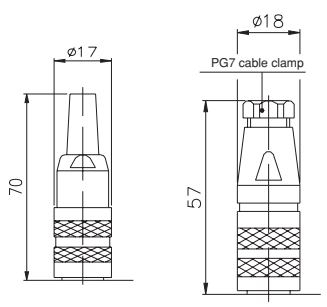
ACCESSORIES

STANDARD ACCESSORIES — **Code**

Fixing kit for PY2:
4 brackets, M4x10 screws, grower — **PKIT005**

Ball tip — **PTAS000**

OPTIONAL ACCESSORIES



CON011 - IP40 Prot. (5 pole Female conn.)

CON012 - IP67 Prot. (5 pole Female conn.)

CON013 - IP40 Prot. (5 pole Female conn.)

Extraction length of the connector 10 mm.

ORDER CODE

Displacement transducer **PY2** □ □ □ □

Cable output	**F**
Connector output DIN43322	**C**

Model

3-pole PVC cable output 3 x 0,25 1m	**S**
Connector output	**----**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**PY2 - C - 100**
Displacement transducer model PY2, 5-pole connector output, useful electrical stroke (C.E.U.) 50mm.

GEFRAN

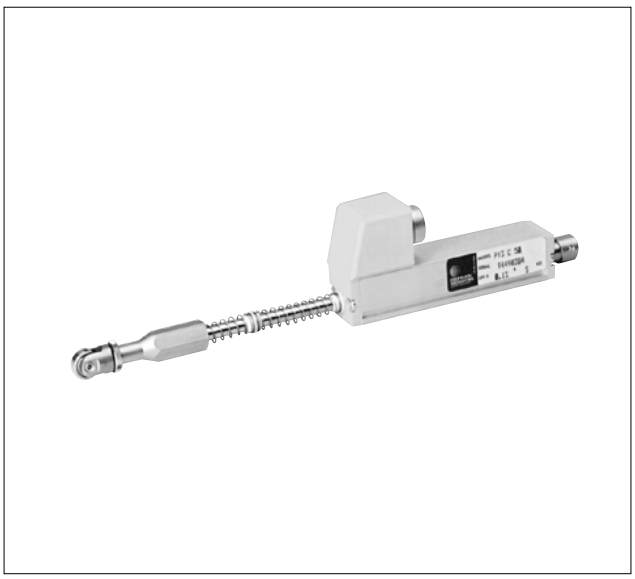
GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

CSQ UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

cod. 84917-08/01

PY3

RECTILINEAR DISPLACEMENT TRANSDUCER WITH BEARING TIP



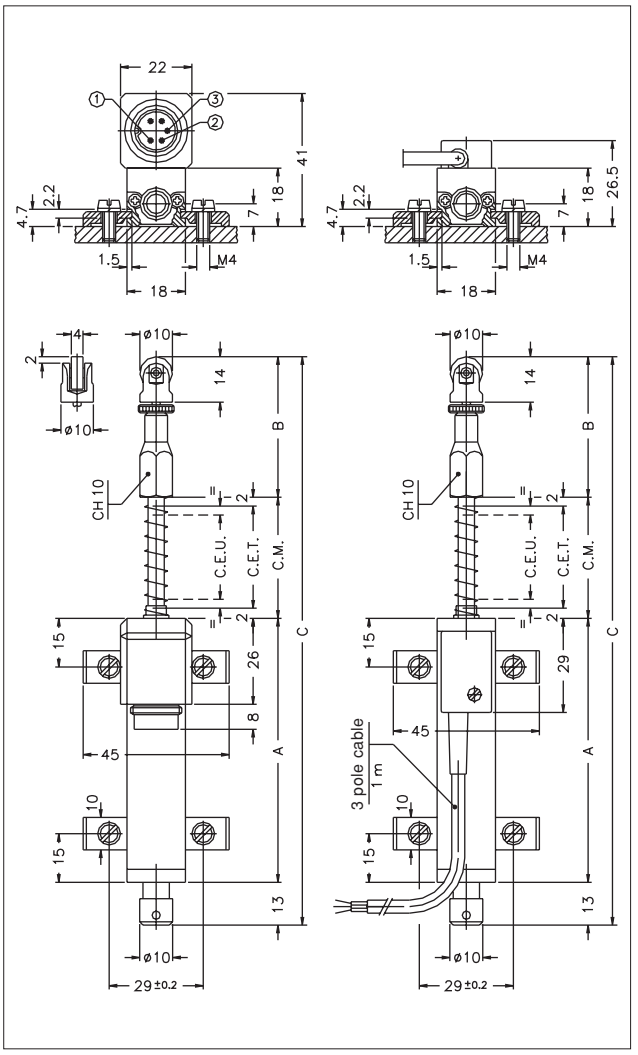
Main features

- *25 to 50 mm. stroke*
- *Double support of the control rod and return spring*
- *Tip with M2.5 thread and stainless steel precision bearing*
- *Independent linearity up to ± 0,1%*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Inhibited rotation of the control rod*
- *Displacement speed up to 10 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  PY3 F 3-pole 1m. screened cable 1m.
  PY3 C 5-pole connector DIN43322
- *Life duration: > 100x10⁶ operations (within C.E.U.)*
- *Grade of protection IP40*

TECHNICAL DATA

Useful electrical stroke (C.E.U.)	25/50
Independent linearity (within C.E.U.)	see table
Displacement speed	≤ 10 m/s
Displacement force	≤ 4N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	see table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GF 40
Control rod material	Stainless steel AISI 303
Fixing	Brackets with variable longitudinal axis

MECHANICAL DIMENSIONS

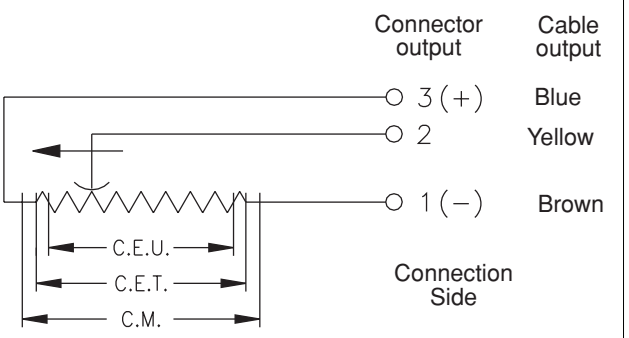


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

MECHANICAL / ELECTRICAL DATA

MODEL		25	50
Useful electrical stroke (C.E.U.) +1/-0	mm	25	50
Theoretical electrical stroke (C.E.T.) ±1	mm	C.E.U. + 1	
Resistance (C.E.T.)	kΩ	1	5
Independent linearity (within C.E.U.)	± %	0,2	0,1
Dissipation at 40° (0W at 120°C)	W	0,6	1,2
Maximum applicable voltage	V	25	60
Mechanical stroke (C.M.)	mm	C.E.U. + 5	
Case length (A)	mm	C.E.U. + 38	
Tip length (B)	mm	43	51
Total length (C)	mm	149	207

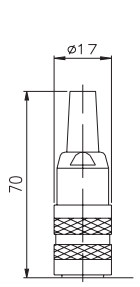
ELECTRICAL CONNECTIONS



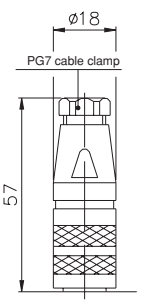
ACCESSORIES

STANDARD ACCESSORIES	Code
Fixing kit for PY3: 4 brackets, M4x10 screws, grower	**PKIT005**
Bearing tip	**PTAS001**

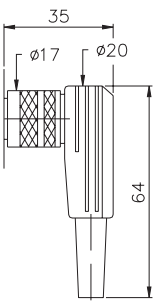
OPTIONAL ACCESSORIES



CON011 - IP40 Prot. (5 pole Female conn.)



CON012 - IP67 Prot. (5 pole Female conn.)



CON013 - IP40 Prot. (5 pole Female conn.)

Extraction length of the connector 10 mm.

ORDER CODE

Displacement transducer **PY3** □ □ □ □

Cable output	**F**
Connector output DIN43322	**C**

Model

3-pole PVC cable output 3 x 0,25 1m	**S**
Connector output	**----**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example: **PY3 - C - 50**
Displacement transducer model PY3, 5-pole connector output, useful electrical stroke (C.E.U.) 50mm.

GEFRAN

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

CSQ UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

cod. 84923-08/01

PZ12

RECTILINEAR DISPLACEMENT TRANSDUCER WITH CYLINDRICAL CASE

Main features

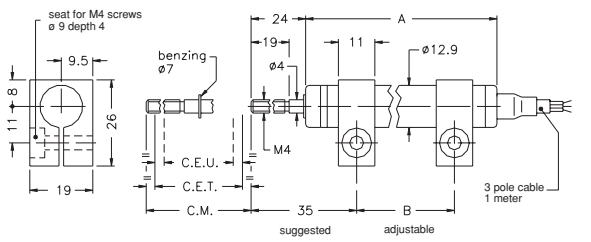
- *25 to 150 mm. stroke*
- *Mechanical fixing using brackets, selfaligning ball-joints or flange*
- *Independent linearity up to ± 0,05%*
- *Infinite resolution*
- *No variation of electrical signal outside theorical electrical stroke*
- *Displacement speed up to 10 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connection: 3-pole screened cable (1m length)*
- *Life duration: > 25x10⁶ meters or >100x10⁶ operations whichever is the smaller (within C.E.U.)*
- *Grade of protection IP60*

TECHNICAL DATA

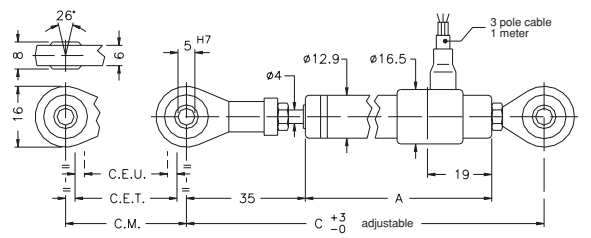
Useful electrical stroke (C.E.U.)	25/50/75/100/125/150
Independent linearity (within C.E.U.)	see table
Displacement speed	≤ 10 m/s
Displacement force	≤ 0.5N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	see table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GV 40
Control rod material	Stainless steel AISI 303
Fixing	Brackets, selfaligning ball-joints or flange

MECHANICAL DIMENSIONS

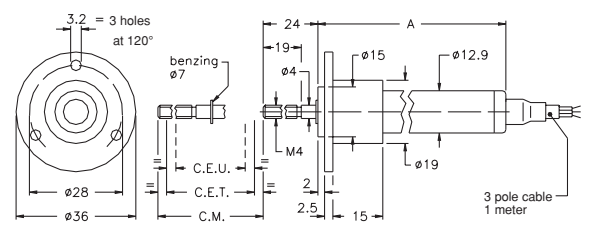
PZ12-S



PZ12-A



PZ12-F

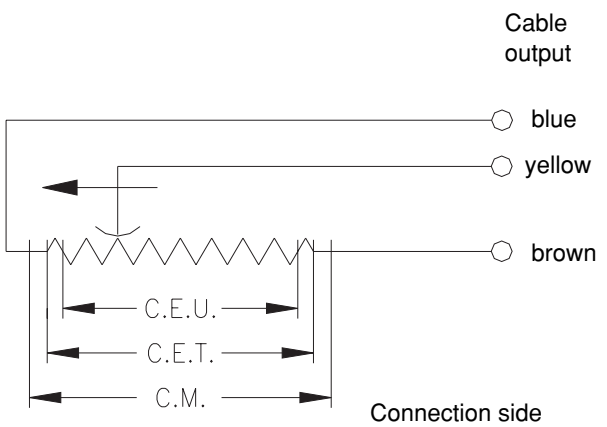


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

MECHANICAL / ELECTRICAL DATA

MODEL			25	50	75	100	125	150
Useful electrical stroke (C.E.U.) + 1 / -0		mm	25	50	75	100	125	150
Theoretical electrical stroke (C.E.T.) ± 1		mm	C.E.U. +1					
Resistance (C.E.T.)		kΩ	1	2	3	4	5	6
Independent linearity (within C.E.U.)		± %	0,2	0,1	0,1	0,1	0,05	0,05
Dissipation at 40°C (0W at 120°C)		W	0,5	1	1,5	2	2,5	3
Maximum applicable voltage		V	20	40	60			
Mechanical stroke (C.M.)		mm	C.E.U. +5					
Case length (A)	mod. PZ12 - S	mm	74,5	99,5	124,5	149,5	174,5	199,5
	mod. PZ12 - A	mm	102	127	152	177	202	227
	mod. PZ12 - F	mm	74,5	99,5	124,5	149,5	174,5	199,5
Recommended distance between brackets (B)		mm	42	67	92	117	142	167
Minimum distance between ball-joints (C)		mm	153	178	203	228	253	278
Weight	mod. PZ12 - S	g	45	55	65	75	85	95
	mod. PZ12 - A	g	70	80	90	100	110	120
	mod. PZ12 - F	g	60	70	80	90	100	110

ELECTRICAL CONNECTIONS



STANDARD ACCESSORIES

	Code
2 mounting brackets for PZ12-S	**STA074**

ORDER CODE

Displacement transducer **PZ12** □ □ □

Mounting by brackets	**S**
Mounting by selfaligning ball-joints	**A**
Mounting by flange	**F**

Model

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example: **PZ12 - S - 25**
Displacement transducer model PZ12, mounting by brackets, useful electrical stroke (C.E.U.) 25mm

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

cod. 84875-08/01

PZ34

RECTILINEAR DISPLACEMENT TRANSDUCER WITH CYLINDRICAL CASE

Main features

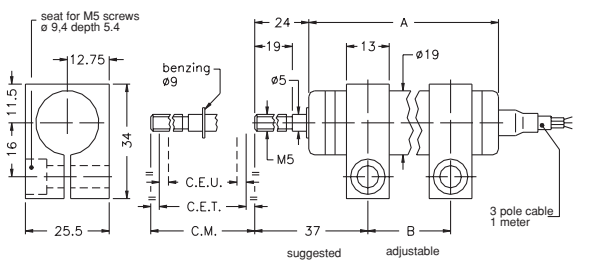
- *25 to 250 mm. stroke*
- *Mechanical fixing using brackets, selfaligning ball-joints or flange*
- *Independent linearity up to ± 0,05%*
- *Infinite resolution*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed 10 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connection: 3-pole screened cable (1m length)*
- *Life duration: > 25x10⁶ meters or >100x10⁶ operations, whichever is the smaller (within C.E.U.)*
- *Grade of protection IP60*

CARATTERISTICHE TECNICHE

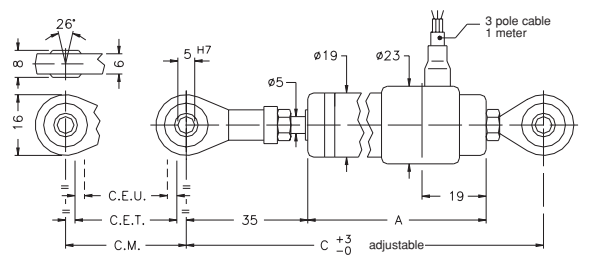
Useful electrical stroke (C.E.U.)	25/50/75/100/125/150/200/250
Independent linearity (within C.E.U.)	see table
Displacement speed	≤ 10 m/s
Displacement force	≤ 0.5N
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Maximum applicable voltage	see table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Case material	Anodised aluminium Nylon 66 GV 40
Control rod material	Stainless steel AISI 303
Fixing	Brackets, selfaligning ball-joints or flange

MECHANICAL DIMENSIONS

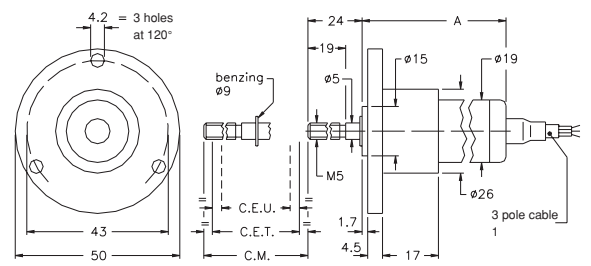
PZ34-S



PZ34-A



PZ34-F

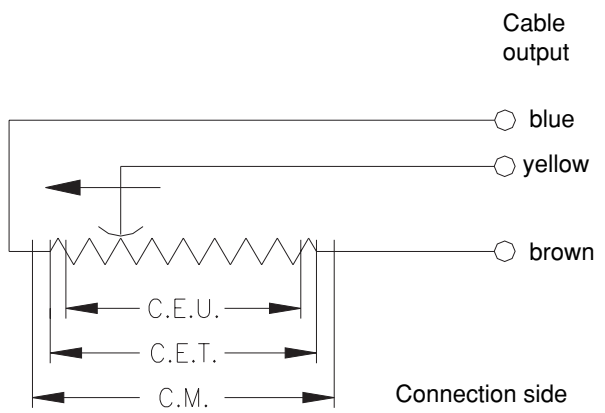


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

MECHANICAL / ELECTRICAL DATA

MODEL			25	50	75	100	125	150	200	250
Useful electrical stroke (C.E.U.) +1/-0		mm	25	50	75	100	125	150	200	250
Theoretical electrical stroke (C.E.T.) ±1		mm	C.E.U. +1							
Resistance (C.E.T.)		kΩ	1	2	3	4	5	6	8	10
Independent linearity (within C.E.U.)		± %	0,2	0,1	0,1	0,1	0,05	0,05	0,05	0,05
Dissipation at 40°C (0W at 120°C)		W	0,8	1,6	2,6	3				
Maximum applicable voltage		V	20	40	60					
Mechanical stroke (C.M.)		mm	C.E.U. +5							
Case length (A)	mod. PZ34 - S	mm	83,5	108,5	133,5	158,5	183,5	208,5	258,5	308,5
	mod. PZ34 - A	mm	110	135	160	185	210	235	285	335
	mod. PZ34 - F	mm	83,5	108,5	133,5	158,5	183,5	208,5	258,5	308,5
Recom. distance between brackets (B)		mm	47	72	97	122	147	172	222	272
Min. distance between ball-joints (C)		mm	163	188	213	238	263	288	338	388
Weight	mod. PZ34 - S	g	90	105	130	160	175	190	215	245
	mod. PZ34 - A	g	110	125	150	180	195	210	235	260
	mod. PZ34 - F	g	100	115	140	170	185	200	225	255

ELECTRICAL CONNECTIONS



STANDARD ACCESSORIES

	Code
2 mounting brackets for PZ34-S	**STA075**

ORDER CODE

Displacement transducer **PZ34** □ □ □

Mounting by brackets	**S**
Mounting by selfaligning ball-joints	**A**
Mounting by flange	**F**

Model

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**PZ34 - F - 125**
Displacement transducer model PZ34, mounting by flange, useful electrical stroke (C.E.U.) 125mm.

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

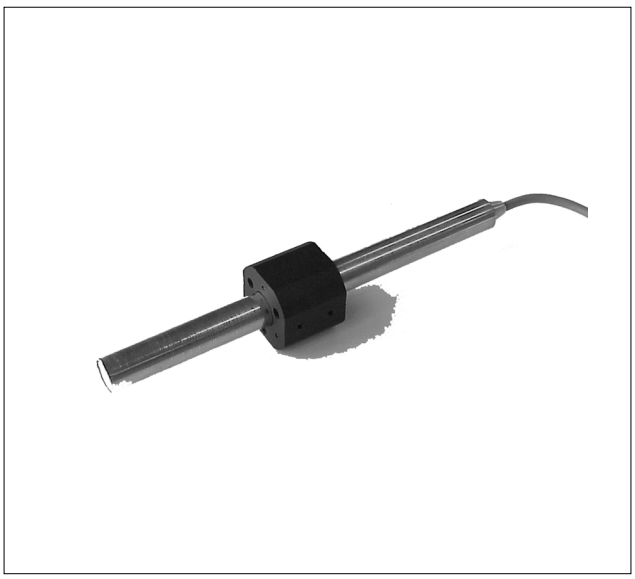
UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

cod. 84881-08/01

PME12

RECTILINEAR DISPLACEMENT TRANSDUCER WITH MAGNETIC DRAG

Patent Pending



Main features

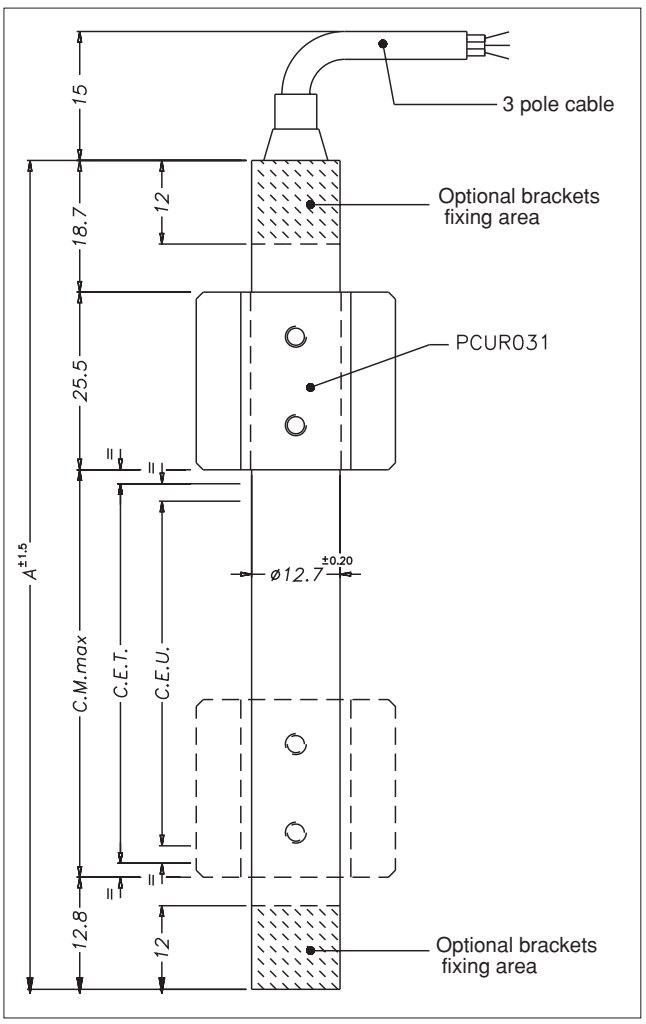
- *50 to1000 mm. strokes*
- *Cursor magnetic drag*
- *Independent linearity ± 0,05%*
- *Repeatibility: 0.08 mm*
- *Hysteresis: 0.25 mm*
- *Infinite Resolution*
- *No variation of electical output signal outside theoretical electrical stroke*
- *Working temperature: -30...+100°C*
- *Electrical connection: 3-pole polyurethane screened cable with high flexibility (1m lenght)*
- *Lifetime: > 25x10⁶ meters or >100x10⁶ operations, whichever is the smallest (within C.E.U.)*
- *IP67 waterproof, (IEC 60529)*
- *Suitable for pneumatic applications with working pressures max. 20bar, 50bar peak*

Rectilinear potentiometric displacement transducer without dragging shaft; completely waterproof (IP67); designed to work whether in wet environments or temporarily submerged (IEC 60529). The PME series is characterised by an external magnetic actuator coupled with an internal measurement cursor. The magnetic cursor substitutes the dragging tree used in the traditional displacement transducers; by this way, the overall dimensions are smaller.

TECHNICAL DATA

Useful electical stroke (C.E.U.)	50 to 1000 mm
Independent linearity (within C.E.U.)	see table
Displacement speed	≤ 5 m/s
Max. acceleration	≤ 10m/s² displacement
DIN vibration IEC 68T2-6	12g, 10...2000Hz
Cursor dragging force	≤ 0,5 N
Shock test DIN IEC68T2-27	50 g, 11ms. single shock
Displacement sensitivity (no hysteresis)	from 0.05 to 0.1 mm
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current in in case of bad performances	10mA
Maximum applicable voltage	see table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strenght	<100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Enviromental protection	IP 67
Actual temperature coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C

MECHANICAL DIMENSION

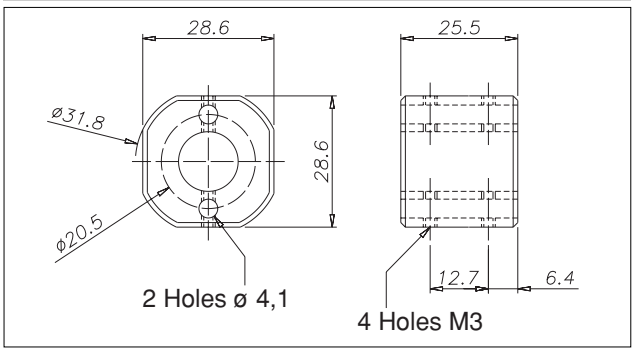


Importante: All the data reported in the catalogue linearity and temperature coefficients are valid for sensor utilization as a ratiometric device with a max. current across the cursor circuit Ic ≤ 0.1 μA.

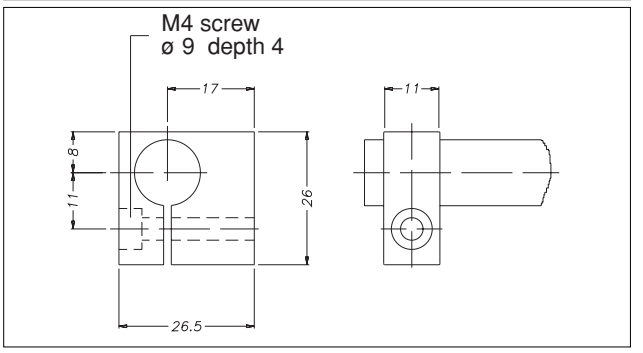
MECHANICAL / ELECTRICAL DATA

MODEL		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Useful electrical stroke (C.E.U.) + 1 / -0	mm	Model																			
Theoretical electrical stroke (C.E.T.) ± 1	mm	C.E.U. + 1																			
Resistance (C.E.T.)	kΩ	5								10							20				
Independent linearity (within C.E.U.)	±%	0,1								0,05											
Dissipation at 40°C (0W at 120°C)	W	1	2							3											
Max applicable voltage	V	40								60											
Mechanical stroke (C.M)	mm	C.E.U. + 5																			
Case Lenght (A)	mm	C.E.U. + 61,5																			

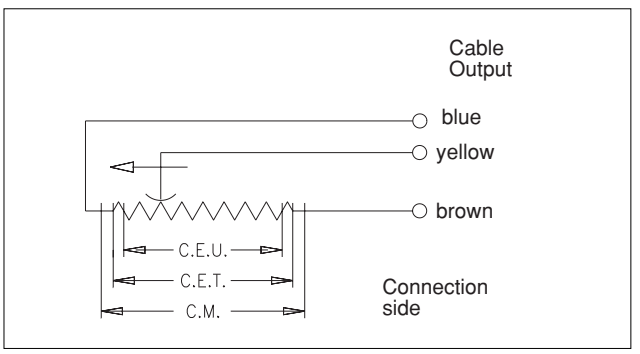
PCUR031 CURSOR



STA001 BRACKETS



ELECTRICAL CONNECTIONS



ORDER CODE

Displacement transducer **PME** | **12** | **F** | | **S**

- Dimension 1/2”
- 3-pole PVC cable output 3x0,25 1m
- Model
- Brackets

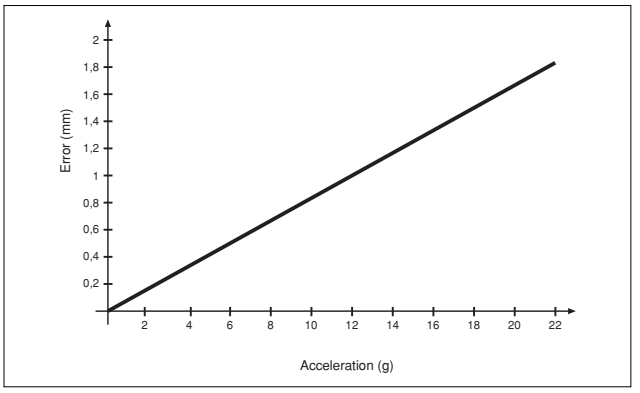
If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example: **PME-12-F-400-S** **0000-X000-XX-00-XXX**
PME12 model transducer, useful electrical stroke (C.E.U.) 400mm, mounting by brackets.

Included in the delivery

- Displacement Transducer PME series
- N° 2 Fixing brackets code: **STA001**
- N° 1 Magnetic cursor code: **PCUR032**

TRACKING ERROR



CODE EXTENSION

0	0	0	0	X	0	0	0	X	X	0	0	X	X	X

CABLE LENGHT (1mt F standard version)
F output **00** =1mt **02** =2mt **03** =3mt **04** =4mt **05** =5mt
10 =10mt **15** =15mt

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
www.gefranonline.com

UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

PMI12

RECTILINEAR DISPLACEMENT TRANSDUCER WITH MAGNETIC DRAG *Patent Pending*

Main features

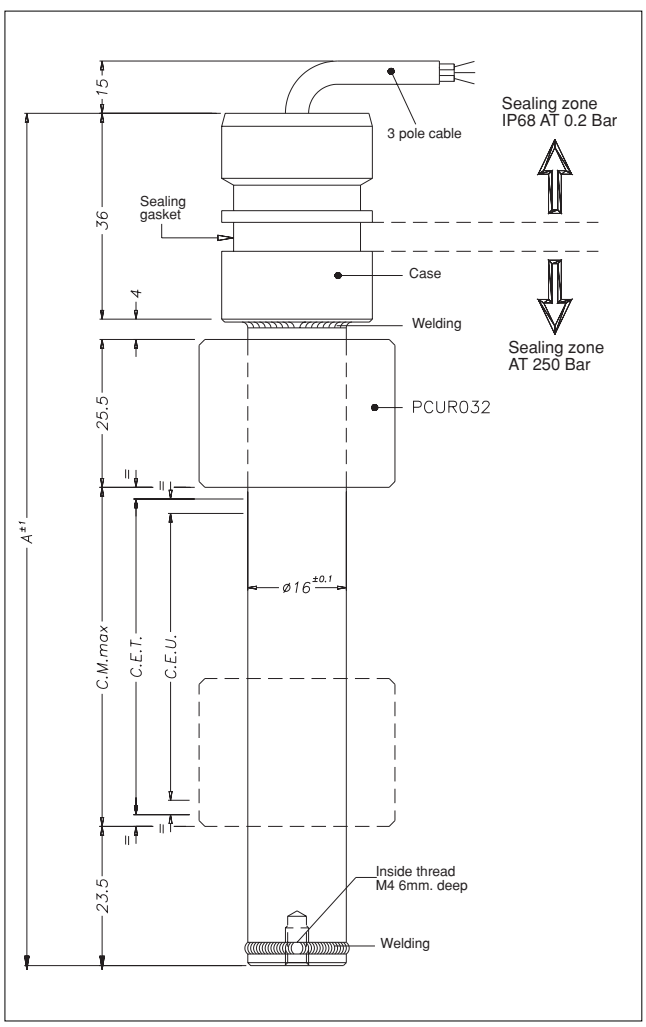
- *50 to 1000 mm strokes*
- *Cursor magnetic drag*
- *Independent linearity up to ± 0,05%*
- *Repeatibility: ≤ 0.08 mm*
- *Hysteresis: ≤ 0,25 mm*
- *Tracking error (see table)*
- *Infinite resolution*
- *No variation of electrical output signal outside theoretical electrical stroke*
- *Working temperature: -30...+100°C*
- *Electrical connection: 3-pole polyurethane screened cable with high flexibility (1m lenght)*
- *AISI 316 stem and nipple*
- *Lifetime: > 25x10⁶ meters or >100x10⁶ operations whichever is the smallest (within C.E.U.)*
- *Max. working pressure 250bar, 400bar peak*

Rectilinear potentiometric displacement transducer without dragging shaft; completely waterproof (IP68); designed to work with high pressure applications (250bar static, 400bar peak) i.e. hydraulic cylinders. The PMI series is characterised by an external magnetic actuator coupled with an internal measurement cursor.

TECHNICAL DATA

Useful electical stroke (C.E.U.)	50 to 1000 mm
Linearità indipendente (within C.E.U.)	see table
Displacement speed	≤ 5 m/s
Max. acceleration	≤ 10m/s² displacement
DIN vibration IEC 68T2-6	12g, 10...2000Hz
Cursor dragging force	≤ 0,5 N
Shock test DIN IEC68T2-27	50 g, 11ms. single shock
Displacement sensitivity (no hysteresis)	0.05 to 0.1 mm
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current in case of bad performances	10mA
Maximum applicable voltage	See table
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strenght	< 100μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Enviromental protection	IP 68, max. pressure 250 bar, 400 bar peak
Actual temperature coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-30...+100°C
Storage temperature	-50...+120°C

MECHANICAL DIMENSION

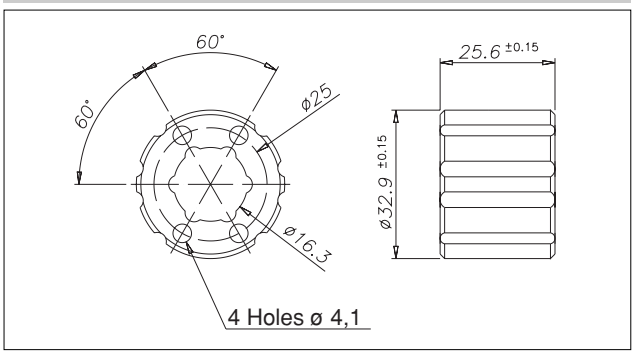


Important: All the data reported in the catalogue linearity and temperature coefficients are valid for a sensor utilization as a ratiometric device with a max current across the cursor circuit Ic ≤ 0.1 μA.

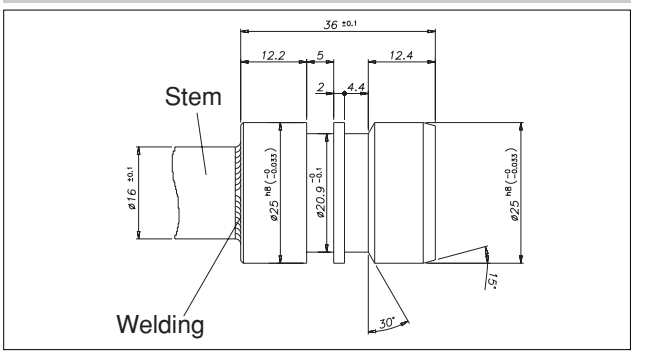
MECHANICAL / ELECTRICAL DATA

MODEL		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Useful electrical stroke (C.E.U.) + 1 / -0	mm	Model																			
Theoretical electrical stroke (C.E.T.) ± 1	mm	C.E.U. + 1																			
Resistance (C.E.T.)	kΩ	5								10							20				
Independent linearity (within C.E.U.)	±%	0,1								0,05											
Dissipation at 40°C (0W at 120°C)	W	1	2							3											
Max applicable voltage	V	40								60											
Mechanical stroke (C.M)	mm	C.E.U. + 5																			
Case Lenght (A)	mm	C.E.U. + 94																			

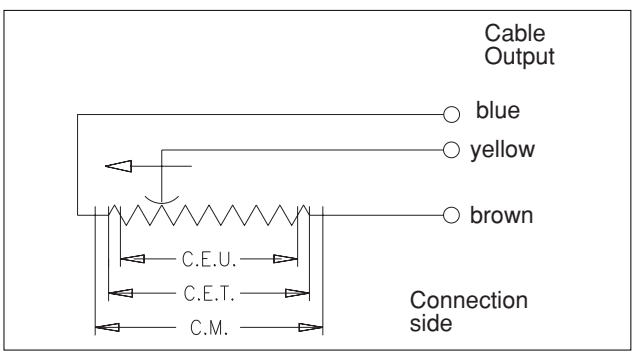
PCUR032 CURSOR



CASE DIMENSION



ELECTRICAL CONNECTIONS



ORDER CODE

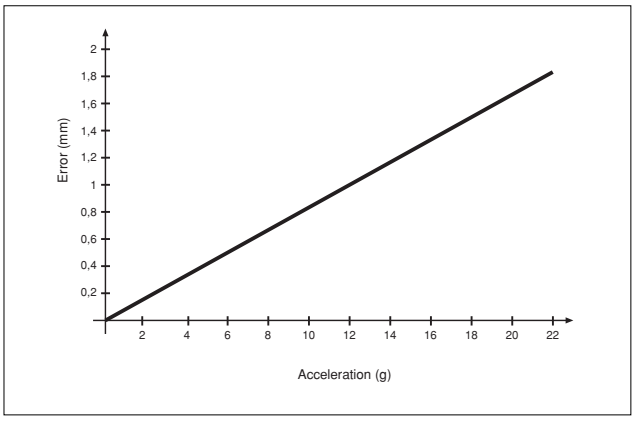
Displacement transducers **PMI** | 12 | F | | X |

- Dimensions 1/2”
- 3-pole PVC cable output 3x0,25 1m
- Model
- Free code

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example: **PMI-12-F-400-X 0000-X000-XX-00-XXX**
PMI 12 model transducer, useful electrical stroke (C.E.U.) 400mm.

TRACKING ERROR



Included in the delivery

- Displacement Transducer PMI series
- N° 1 Magnetic cursor code: **PCUR032**

CODE EXTENSION

0	0	0	0	X	0	0	0	X	X	0	0	X	X	X

CABLE LENGHT (1mt F standard version)
F output **00** =1mt **02** =2mt **03** =3mt **04** =4mt **05** =5mt
10 =10mt **15** =15mt

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
www.gefranonline.com

UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

IC

RECTILINEAR DISPLACEMENT TRANSDUCER FOR MOUNTING INSIDE HYDRAULIC ACTUATORS

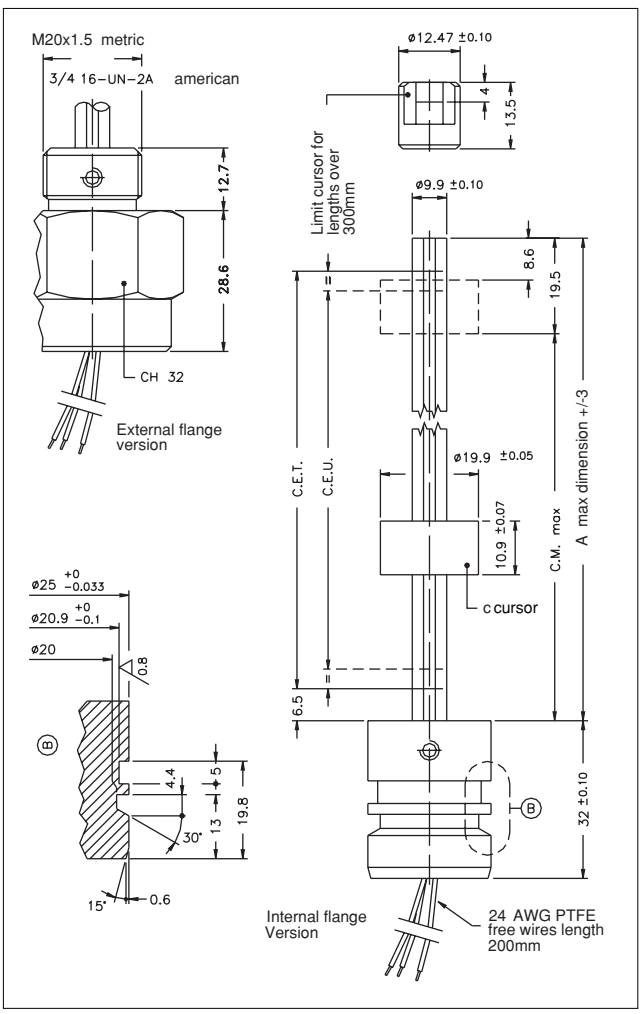
Main features

- *100 to 550 mm stroke*
- *Mechanical fixing by internal or external flange*
- *Independent linearity ± 0,1%*
- *Infinite resolution*
- *Repeatability 0,01 mm.*
- *No variation of electrical signal outside theoretical electrical stroke*
- *Displacement speed up to 1,5 m/s*
- *Working temperature: -30...+100°C*
- *Electrical connections:*
  IC C 6-pole connector
  IC F 3 free wires (200 mm length).
- *Life duration: > 25x10⁶ meters or >100x10⁶ operations, whichever is the smaller (within C.E.U.)*
- *Max. operating pressure 340 bar (5000 psi)*

TECHNICAL DATA

Model	100/150/200/300/350/500/550
Independent linearity (within C.E.U.)	± 0,1%
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Tolerance on resistance	± 20%
Recommended cursor current	< 0,1μA
Maximum cursor current	10 mA
Dissipation at 40°C (0W at 120°C)	3W
Maximum applicable voltage	60 V
Temperature Coefficient of the resistance	-200 ± 200 ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5 ppm/°C
Electrical isolation	> 100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100μA at 500V~, 50Hz, 2s, 1bar
Working temperature	-30...+100°C
Storage temperature	-50...+120°C
Displacement speed	≤ 1.5 m/s
Displacement force	≤ 1 N
Stem material	Anodised aluminium
Flange material	Stainless steel AISI 303
Fixing	Internal or external flange

MECHANICAL DIMENSIONS

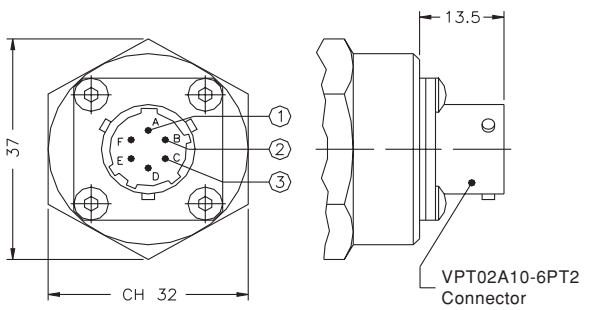


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

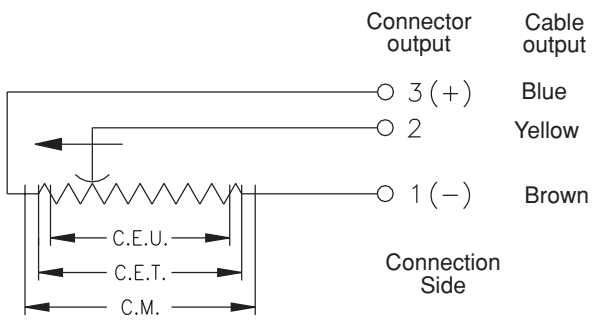
MECHANICAL / ELECTRICAL DATA

MODEL		100	150	200	300	350	500	550
Useful electrical stroke (C.E.U.) ± 1	mm	MODEL + 4						
Theoretical electrical stroke (C.E.T.) ± 1	mm	MODEL + 10						
Resistance (C.E.T.)	kΩ	10						
Mechanical stroke (C.M.) ± 1	mm	MODEL + 4						
Maximum length (A)	mm	123,5	173,5	223,5	323,5	373,5	523,5	573,5

EXT. FLANGE VERSION / CONNECTOR



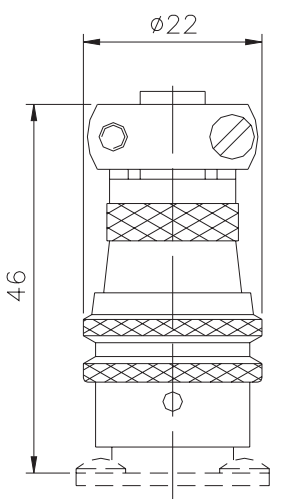
ELECTRICAL CONNECTIONS



OPTIONAL ACCESSORIES

	Code
IC application manual	**DOC 020**

Connectors
Only for external flange version



CON300
(6 pole Female connector)

ORDER CODE

Displacement transducer **IC** □ □ □ □ □

3 free wires 200mm length output	**F**
Connector output (only for ext. flange version)	**C**

MODEL

Int. flange version	**I**
Ext. flange version	**E**

Thread		
Internal flange		**---**
External flange	Metric	**M**
	American	**I**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example: **IC - F - 300 - E - M**
Displacement transducer model IC, 3 free wires 200mm. length output, external flange, metric thread and useful electrical stroke (C.E.U.) 304mm.

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

cod. 84887-08/01

PS

ROTATIVE POSITION TRANSDUCERS
IN CONDUCTIVE PLASTIC

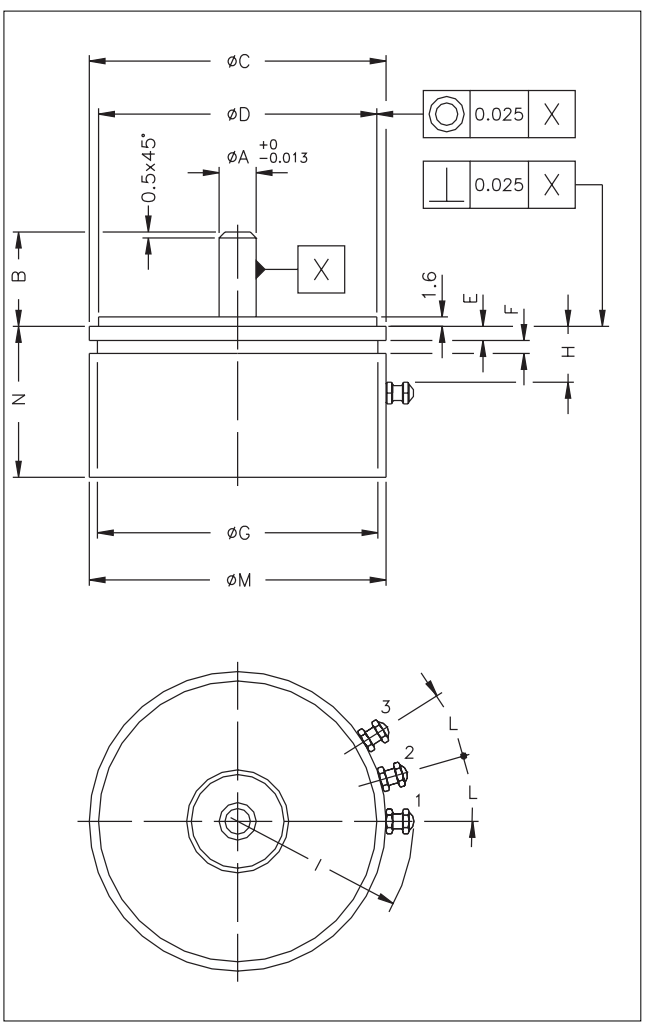
Main features

- *Models 09, 11, 20*
- *Servo mounting*
- *Independent linearity up to ± 0,05% (standard ± 0,5%)*
- *Repetibility 0,01% C.E.T.*
- *Rotation speed ≤ 600 r.p.m.*
- *Life duration: >100x10⁶ operations at 10 r.p.s. (within C.E.U.)*
- *Infinite resolution*
- *Electrical terminals: turrets*
- *Grade of protection IP40*

TECHNICAL DATA

Model	09 - 11 - 20
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Hysteresis (backlash)	≤ 15" of arc
Intermediate pick-offs (TAPS)	on request (max. 4)
Electrical terminals	Gold plated turrets
Torque	≤ 0,20Ncm
Rotation speed	≤ 600 r.p.m.
Life duration (within C.E.U.)	>100x10⁶ operations
Tolerance on resistance total	± 20% other values by request
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-55...+100°C
Storage temperature	-55...+125°C
Case material	Diallylphtalate
Shaft material	AISI 316
Bearings	High precision with double (ZZ) sealed screen in stainless steel
Flange	Anodised aluminium

MECHANICAL DIMENSIONS

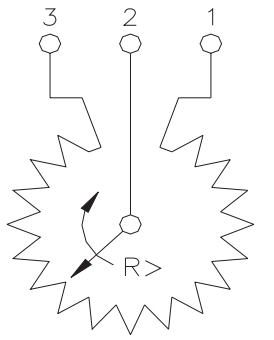


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

MECHANICAL / ELECTRICAL DATA

MODEL		PS09	PS11	PS20
Theoretical electrical stroke (C.E.T.)	°	340 ± 4°	345 ± 4°	350 ± 4°
Useful electrical stroke (C.E.U.)	°	C.E.T. -2°		
Resistance ± 20% (C.E.T.)	kΩ	1 - 4.7 - 10		
Independent linearity (within C.E.U.)	±%	A = ± 1% B = ± 0,5% C = ± 0,25% D = ± 0,1% E = ± 0,05%		
Dissipation at 40°C (0W at 120°C)	W	1	1,25	3
Mechanical rotation	°	360° continuous		
Weight	g	16	20	90

ELECTRICAL CONNECTIONS

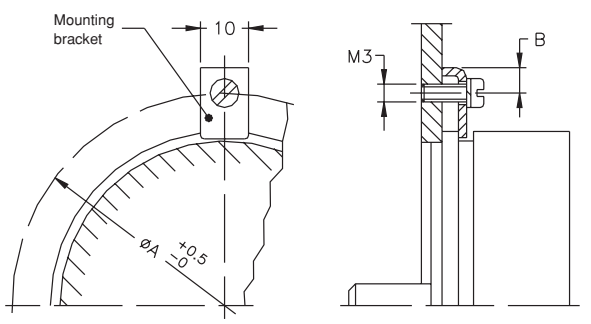


Clockwise viewed from shaft side

DIMENSIONS

DIMENSIONS (mm)	DESCRIPTION	SIZE / MODEL 09 / PS09	SIZE / MODEL 11 / PS11	SIZE / MODEL 20 / PS20
ø A + 0/0.013	ø Stainless steel shaft	3.175	3.175	6.35
B max.	Shaft length	16	16	16
ø C max.	External ø of flange	22.25	27.05	50.8
ø D	ø flange	19.05	24.608	47.625
	Tolerance on flange	+0 -0.013	+0 -0.013	+0 -0.025
E	Shoulder	1.6	1.6	2.4
F min.	Width of groove	1.5	1.5	2.2
ø G max.	Diameter of groove	20	25	48
H min.	Locating turrets	6	6	10
I max.	Radius on turrets	16	18	30
L ± 2°	Angle between turrets	30°	25°	15°
M max.	External ø of case	22.2	27	50.8
N max.	Length for Nr. of elements = 1	21	21	24

MOUNTING DIAGRAM



ORDER OCODE

Rotative transducer **PS** □ □ □ □ □

Model

Linearity (std. B)	**A = ± 1%**
	B = ± 0,5%
	C = ± 0,25%
	D = ± 0,1%
	E = ± 0,05%

TAPS (std. 0)	**0**	

Resistance value (std.103)	**1kΩ**	**102**
	4,7kΩ	**472**
	10kΩ	**103**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**PS20 - 1 - B - 0 - 103**
Rotative transducer model PS20, 1 resistive element, linearity ± 0,5%, no voltage or current intermediate pick-offs, 10kΩ resistance.

OPTIONAL ACCESSORIES

	Code
Fixing kit for PS: 3 brackets, M3x8TC screws, grower	
Rotative transducers PS09 - PS11	**PKIT012**
Rotative transducers PS20	**PKIT013**

GEFRAN

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001 Certificato nr. 9115.GEF1

cod. 84893-08/01

PR65

ROTATIVE POSITION TRANSDUCER
IN CONDUCTIVE PLASTIC

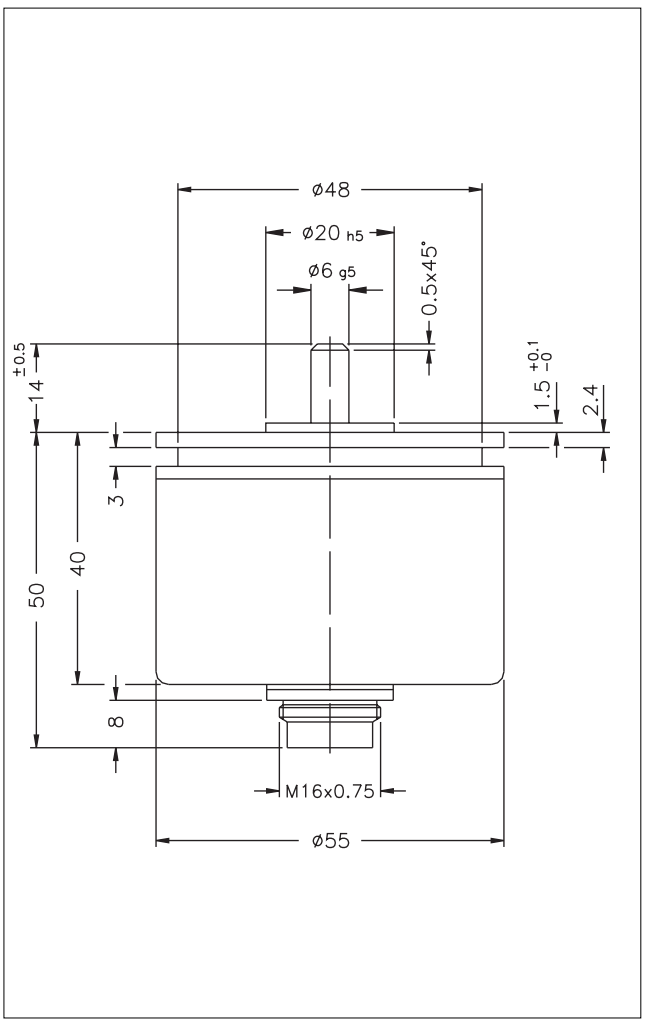
Main features

- *Sealed industrial version*
- *Independent linearity up to ± 0,05% (standard ± 0,5%)*
- *Working temperature: -55...+100°C*
- *Repetibility 0,01% della C.E.T.*
- *Life duration: >100x10⁶ operations at 10 r.p.s. (within C.E.U.)*
- *Infinite resolution*
- *Electrical connection: 5-pole connector DIN 43322*
- *Grade of protection IP65*

TECHNICAL DATA

Model	PR65
Vibrations	5...2000Hz, Amax =0,75 mm amax. = 20 g
Shock	50 g, 11ms.
Hysteresis (backlash)	<= 15” of arc
Intermediate pick-offs (TAPS)	on request (max. 2)
Tolerance on resistance total	± 20%
Recommended cursor current	< 0,1 μA
Maximum cursor current	10mA
Electrical isolation	>100MΩ at 500V=, 1bar, 2s
Dielectric strength	< 100 μA at 500V~, 50Hz, 2s, 1bar
Dissipation at 40°C (0W at 120°C)	see table
Temp. Coeff. of the resistance	-200 ± 200ppm/°C
Actual Temperature Coefficient of the output voltage	< 1,5ppm/°C
Working temperature	-55...+100°C
Storage temperature	-55...+125°C
Case material	Nylon 66 GF 40
Shaft material	AISI 316
Bearings	High precision with double (ZZ) sealed screen in stainless steel
Flange	Anodised aluminium

MECHANICAL DIMENSIONS

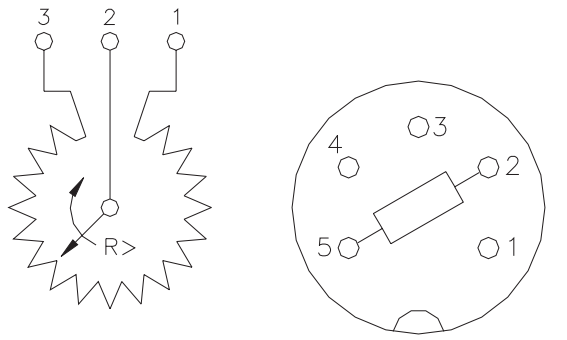


Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

MECHANICAL / ELECTRICAL DATA

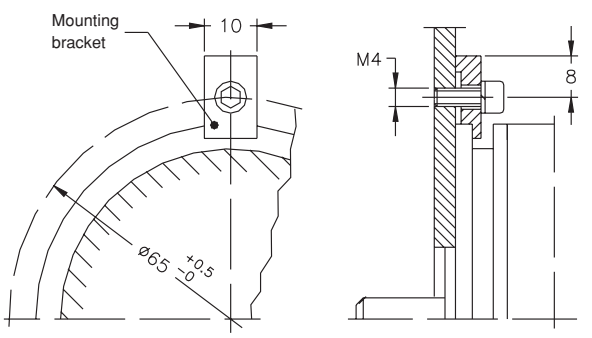
MODEL		PR65
Theoretical electrical stroke (C.E.T.)	°	345 ± 4°
Useful electrical stroke (C.E.U.)	°	C.E.T. -2°
Resistance (C.E.T.)	kΩ	1 - 4.7 - 10
Indipendent linearity (within C.E.U.)	±%	A = ± 1% B = ± 0,5% C = ± 0,25% D = ± 0,1% E = ± 0,05%
Dissipation at 40°C (0W at 120°C)	W	1.25
Mechanical rotation (C.M.)	°	360° continuous
Weight	g	132

ELECTRICAL CONNECTIONS



A 5KΩ protection resistance has been connected between pins 2 (cursor) and 5; in case of the cursor is connected to pin 5, eventual short-circuits due to wiring errors are avoided.

MOUNTING DIAGRAM



ORDER CODE

Rotative transducer **PR65** □ □ □ □

Linearity (std. B)	**A = ± 1%** **B = ± 0,5%** **C = ± 0,25%** **D = ± 0,1%** **E = ± 0,05%**

TAPS (std. 0)	**0**

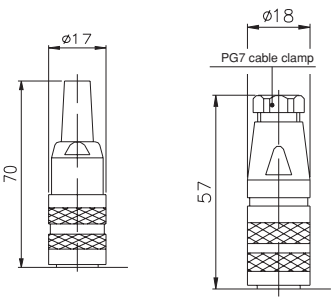
Resistance value (std.103)	**1kΩ**	**102**
	4,7kΩ	**472**
	10kΩ	**103**

If requested, it is possible to supply models with non-standard mechanical and/or electrical features

Example:**PR65 - B - 0 - 103**
Rotative transducer model PR65, linearity ±0,5%, no voltage or current intermediate pick-offs, 10kΩ resistance.

OPTIONAL ACCESSORIES

	Code
Fixing kit for PR65: 3 brackets, M4x10TCEI screws, grower	**PKIT008**



CON011 - IP40 Prot. (5 pole Female conn.)

CON012 - IP67 Prot. (5 pole Female conn.)

CON013 - IP40 Prot. (5 pole Female conn.)

Extraction length of the connector 10mm.

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

cod. 84899-08/01

PCIR

SIGNAL CONDITIONER FOR LINEAR OR ROTATIVE DISPLACEMENT TRANSDUCERS

Main features

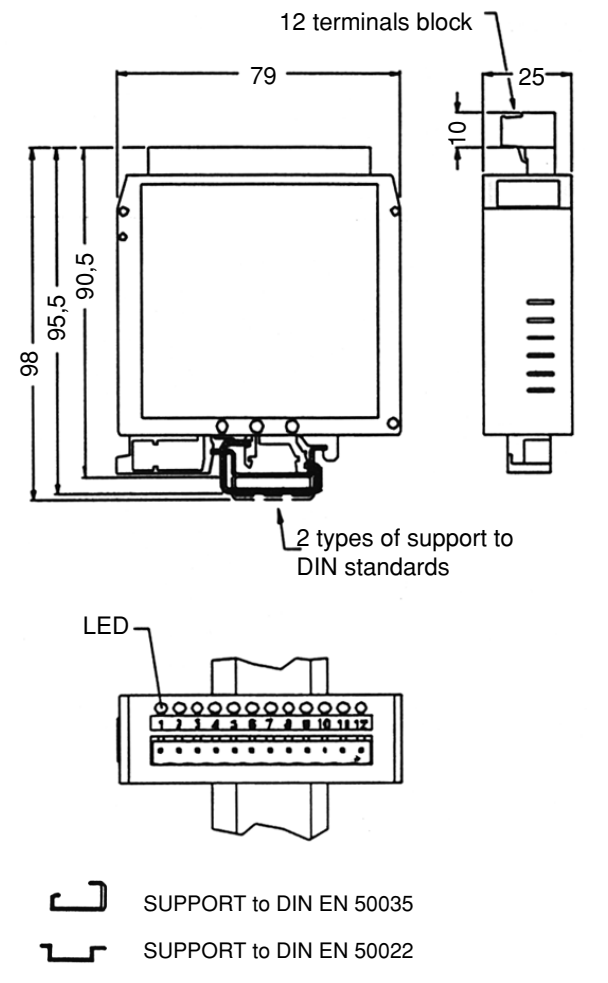
- *High impedance input >100 Mohm*
- *Voltage output 0...10V*
- *Linearity error < 0,02% full scale output*
- *Can be connected simultaneously to two transducers*
- *Low thermal drift 0,01% full scale / °C*
- *Suitable for DIN rail mounting EN50035 and EN50022*

The PCIR signal conditioners have been designed to enable the user to adapt the output impedance of linear or rotative displacement transducers in conductive plastic for acquisition systems or PLC, in a way that does not alter the linearity of the transducer itself.

TECHNICAL DATA

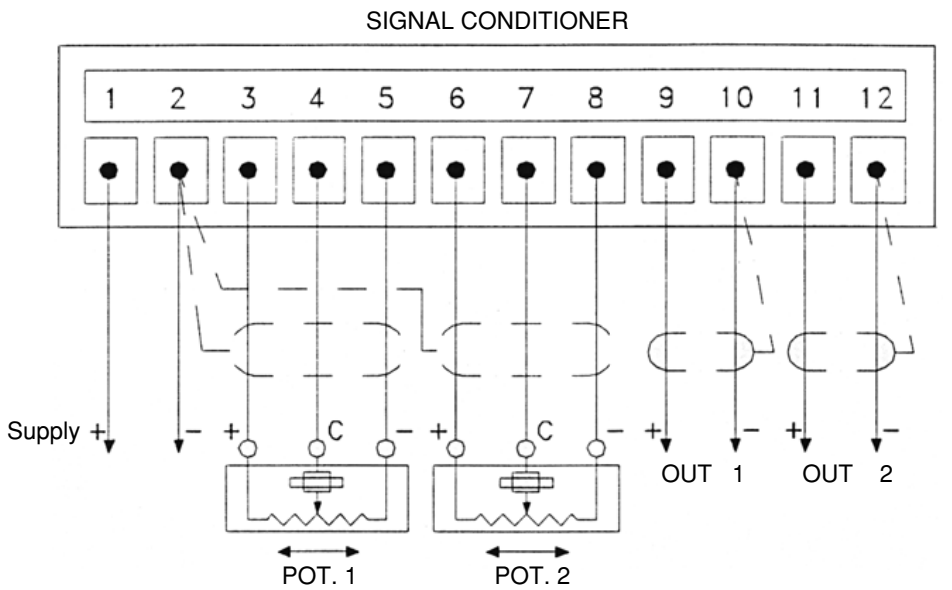
Linearity error	< 0.02%FSO
Transducer resistance	1...20kΩ
Input impedance of cond.	> 100 MΩ
Output load resistance	> 10kΩ
Supply voltage	15...30Vdc
Current drain	< 70mA
Supply voltage to transducer	10Vdc
Output signal at zero	0mA
Zero signal accuracy	± 0,1%FSO
Full scale output	10Vdc
Full scale output accuracy	± 0,1%FSO
Inverse polarity protection	Yes
Output shortcircuit protection	Yes
Response time (10...90%FSO)	< 5ms
Output noise (RMS 10...400Hz)	-70 db FSO
Temperature range: Working StoStorage	-10...+70°C -50...+100°C
Typical thermal drift of zero	± 0.01%FSO/°C
Typical thermal drift of span	± 0.01%FSO/°C
Case material	Polyamide
Protection degree	IP30 - EN60529

MECHANICAL DIMENSIONS



Important: all the data reported in the catalogue linearity, lifetime, temperature coefficient are valid for a sensor utilization as a ratiometric device with a max current across the cursor Ic ≤ 0.1 μA.

ELECTRICAL CONNECTIONS



OPTION ACCESSORIES

Cables and assembled cables **on request**

ORDER CODE

PCIR □

MODEL	
Output signal 0...10Vdc	**A**

Example.:**PCIR**
Signal conditioner for linear or rotary displacement transducers with output signal at full scale of 10Vdc.

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

cod. 84935-08/01

PCIR101 - PCIR102

SIGNAL CONDITIONER WITH VOLTAGE (101), CURRENT 4...20mA (102) OUTPUT FOR DISPLACEMENT TRANSDUCERS

Main features

- *Interface module integrated in the connector*
- *Standard output 0...10Vdc (PCIR 101)*
- *Standard output 4...20mA(PCIR 102)*
- *High linearity*
- *Low zero and span thermal drift*
- *Adjustable Zero and Span*

The signal conditioner with 0...10Vdc (PCIR101) or 4...20mA (PCIR102) output for displacement transducers are manufactured with a single SMD circuit with high stability electronics components that grant a very good linearity and thermal stability. The circuit is integrated in a 4-pole connector, with the possibility to adjust the trimmers of zero and span. It is possible to rotate the internal part of the connector by 90° steps, allowing the installation of the conditioner on the transducer in four different directions.

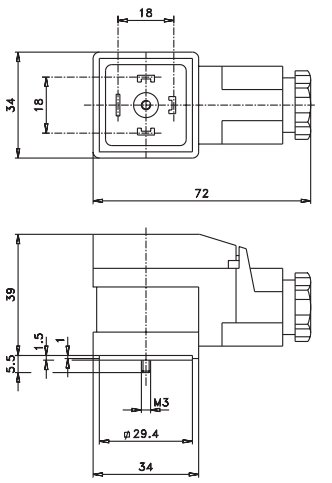
TECHNICAL DATA

Model	**PCIR101**	**PCIR102**
Power supply	15...30Vdc	10...30Vdc
Max. current consumption	15mA	32mA
Output signal	0...10Vdc	4...20mA
ZERO adjustment range	±10% FSO	±10% FSO
SPAN adjustment range	±10% FSO	±10% FSO
Minimum load	10kOhm	see diagr.
Response time (10...90%FSO)	1 msec.	6 msec.
Output noise (RMS 10...400Hz)	<0,05%FSO	<0,05%FSO
Inverse polarity protection	YES	YES
Impulsive voltage peaks protect.	YES	YES
Zero and Span thermal drift in the compensated temp. range	<0,03% FSO/°C	<0,03% FSO/°C
Compensated temperat. range	-20...+80°C	-20...+80°C
Operating temperature range	-30...+85°C	-30...+85°C
Typical linearity error	0,01%FSO	0,01%FSO
Transducer supply	2,5Vdc ± 1%	1,65Vdc ± 1%
Transducer resistance	>700 Ohm	>700 Ohm
Input impedance	>10 MOhm	>10 MOhm
Protection degree	IP65	IP65
Connection cable diameter	0,5mm²	0,5mm²
Connection cable ø 4...10mm	3 wires with screen	2 wires with screen
Weight	80gr	80gr.

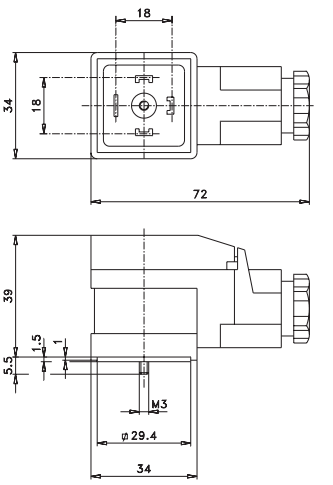
FSO: Full Scale Output (output signal at nominal pressure)

MECHANICAL DIMENSIONS

PCIR101

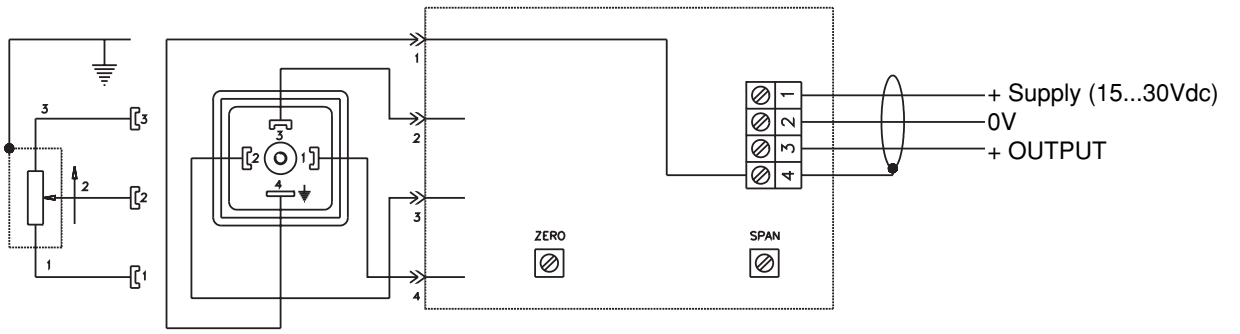


PCIR102

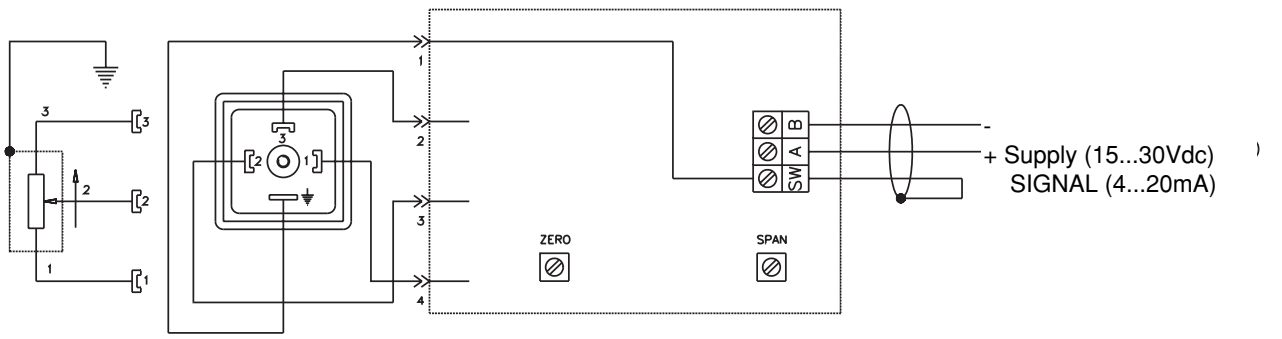


ELECTRICAL CONNECTIONS

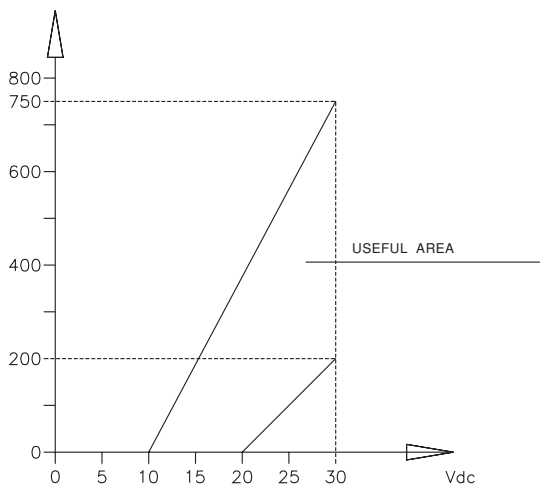
PCIR101



PCIR102



LOAD DIAGRAM



The diagram at side shows the optimum ratio between the load and supply voltage for the 4...20mA conditioner. For a correct function it is necessary to use a combination of load resistance and supply voltage that falls within the shaded area.

ORDER CODE

PCIR 10 □ □

OUTPUT	
0...10Vdc	**1**
4...20mA	**2**

Non standard mechanical and / or electrical features are available on request.

Ex.:**PCIR 101**
Signal conditioner with 10Vdc output.

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

code 84947 - 08/01

CFBA
CAN FIELD BUS ADAPTER

Main features

- *Simple networking solution*
- *Low cost digital communication*
- *Reduces the cost and time to wire and install industrial automation devices*
- *Interchangeability*
- *Transmission speed 500k baud (max. 1000M baud)*
- *Typical application: slave*
- *Easy configuration node*

The “CAN Field Bus Adapter” (CFBA) development is for an easy configuration node. By software, or only with some electrical connections on the board, is possible establish: **Baud Rate, Node-Identifier, the direction of the signal in case of potentiometric sensor**.
The particular structure of CFBA, the small encumbrance and the connections, facilitates the converting of systems to this networking solution.
The type P of CFBA is suited of potentiometric displacement transducers and the supply voltage Vs(5V) of the transducer is ratiometric with Vref. of ADC. In the type V, Vs on analog port is the same of the Vcc on signal port. In this case the standard range for analog input Vin is 5V (2,5 or 10V if jumper WP1 on the board is set). Other values on request. The CFBA includes all hardware modules necessary to implement the CAN Transfer Layer, which represents the kermel of the CAN Bus protocol.
Up to message level, the CFBA is totally compatible with the basic CAN and the full CAN implementation. Functional differences are related to the object layer only. Whereas a full CAN controller provides dedicated hardware for handling a set of messages, the CFBA is restricted to receiving and/or transmitting messages on a messages by message basis. It will never initiate an Overload Frame.

TECHNICAL DATA

General Characteristics

Symb.	Parameter	Condit.	Min	Typ.	Max	Unit
Vcc	Supply voltage		7,5		35	Vdc
Icc	Supply current		20			mA
	Resolution			12		bits
	No missing codes		12			bits
	Integral linearity			±1		LSB
	Differential linearity			±0,5		LSB
	Offset error			0,75		LSB
	Gain error			±2		LSB
	Conversion time		180			µsec
TAMB	Operating amb. temp.		-20		+80	°C
TAMB	Storage amb. temp.		-30		+85	°C

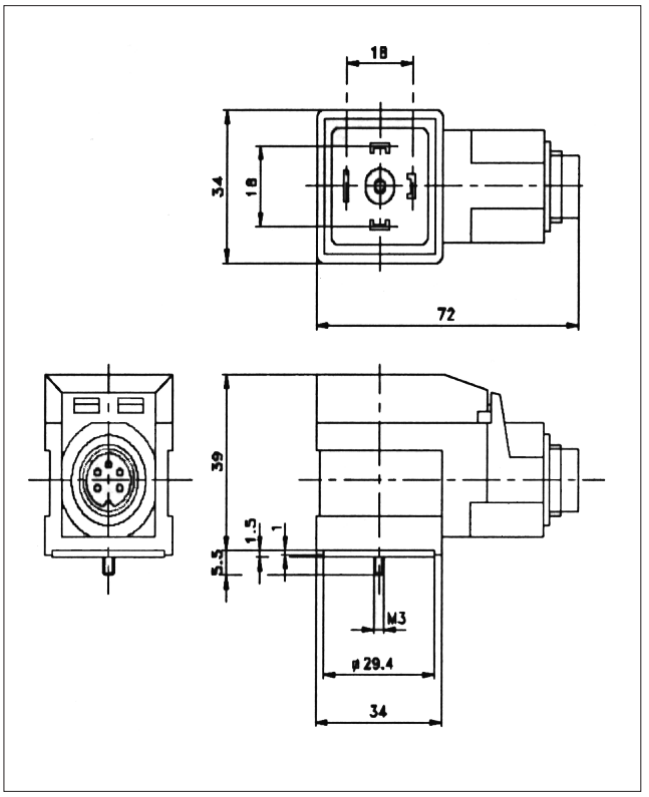
Analog port

Symb.	Parameter	Condit.	Min	Typ.	Max	Unit
Vs	Supply output voltage	type P	4,8	5	5,2	Vdc
		type V		Vcc		Vdc
RLOAD	Load resistance		500			Ω
VIN	Analog input	no shunt			5	Vdc
		shunt			50	Vdc
RIN	Input resistance	no shunt		10		MΩ
		shunt	100			kΩ

Digital port

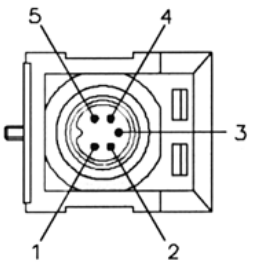
Symb.	Parameter	Condit.	Min	Typ.	Max	Unit
1/tbit	Transmission speed	NRZ			1	Mbaud
VCAN	Input/Output voltage CANH , CANL		-8		+18	Vdc
ΔV	Differential bus voltage transmitter		1,5		3,0	Vdc
ISCH	Short-circuit CANH current	VH = 5			105	mA
ISCL	Short-circuit CANL current	VL = +18			160	mA
RI	CANH/CANL input res.		5		25	kΩ
Rdiff	Differential input res.		20		100	kΩ
CI	CANH, CANL input capacitance				20	pF
Cdiff	Differential input capacitance				10	pF

MECHANICAL DIMENSIONS

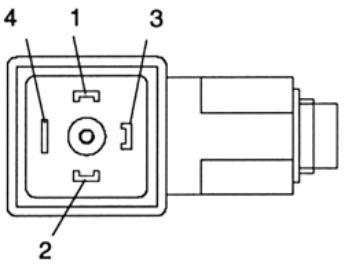


ELECTRICAL CONNECTIONS

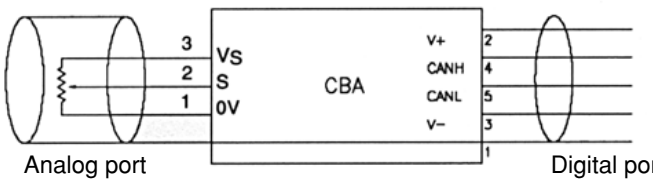
1	Drain
2	V+
3	V-
4	CAN_H
5	CAN_L



1	0V
2	Signal
3	Supply voltage
4	GND



Type P



Analog port

Digital port

PHYSICAL / MEDIA CHARACTERISTICS

The list below presents a summary of the Physical/Media specific characteristics (for fully details of the Device Net please refer to the published specifications).

· Support for up to 64 nodes
· Node removal without severing the network
· Simultaneous support for both network-powered (sensors) and self-powered (actuators) devices
· Protection from wiring errors
· Selectable data rates of 125, 250 e 500kbaud

Baud rate	**Trunk Distance**	**Drop Lenght**	
		Max	**Cumulative**
125kBits/s	500m (1640 ft)	6m (20ft)	156m (512ft)
250kBits/s	250m (820 ft)	6m (20ft)	78m (256ft)
500kBits/s	100m (410 ft)	6m (20ft)	39m (128ft)

· High current capability (up to 16A per supply)
· Standard connections
· Built-in overload protection
· Power available along the bus: both signal and power lines contained in the cable.

We recommended Belden Device Bus for Device Net 1485-P1-C or equivalent.

OPTIONAL ACCESSORIES

ORDER CODE

CFBA □

MODEL	
Type	**P**
Type	**V**

Es.:**CFBA - P**
Can Field Bus Adapter for potentiometric transducer

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D'ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

code 84966 - 08/01

EG

EG01 - EG02 - Pulse rotation encoders
EG03 - Tachometer

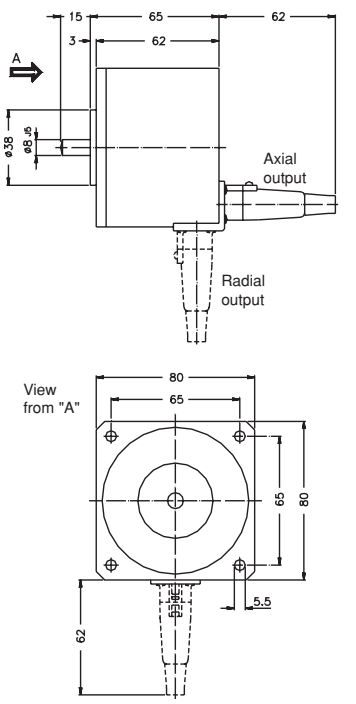
Main features

- *Monodirectional encoder with position hysteresis; outputs x1, x2, x4 (EG01)*
- *Monodirectional or bidirectional, with or without separate zero reference output, encoder (EG02)*
- *Tachometer with analogue output proportional to the speed and digital output (EG03)*
- *The power supply requirements and output signal levels are compatible with all the GEFRAN instruments.*

TECHNICAL DATA

EG01	Monodirectional with hysteresis of the position signal, outputs x1, x2, x4
EG02	Monodirectional, bidirectional, or bidirectional with zero position reference signal (EG02)
EG03	Monodirectional with an analogue output proportional to angular speed (1V/100 r.p.m. - 1V/1000 r.p.m.) depending on scale range, and a digital output which retransmits the fundamental frequency of the encoder (EG03)
Supply	5V , 8...24V (EG01-EG02) - 11...25V (EG03)
Max. consumption	30mA (free outputs)
Digital output	Supply 8...24V VH = Vcc-2V; IOH = 2mA; VL 0.8V; I max = 30mA Supply 5V VH = 2,4V; IOH = 0,7mA; VL 0.4V; FAN OUT = 8TTL
Frequency	Fmax = 50kHz. For the output with hysteresis, the x4 signal is a train of rectangular pulses with a width of 60 µsec.
Analogue output (EG03)	1V/100 r.p.m. for range: 1 to 200 r.p.m. 1V/1000 r.p.m. for ranges: 2 to 2000 r.p.m. 5 to 5000 r.p.m.
Linearity of analogue output	0,2% F.S.
Time constant	(Time to reach 63% f.s.) 350 msec.
Digital output (EG03)	Open collector. V max. 30V, I max. 30mA 240 pulses/turn for ranges: 1 to 2000 r.p.m., 2 to 2000 r.p.m. 100 pulses/turn for range 5 to 5000 r.p.m.
Light source	Infrared LED - estimated life of 10^5 hours
Connections	6 pole connector with axial or radial output

MECHANICAL DIMENSIONS AND DATA

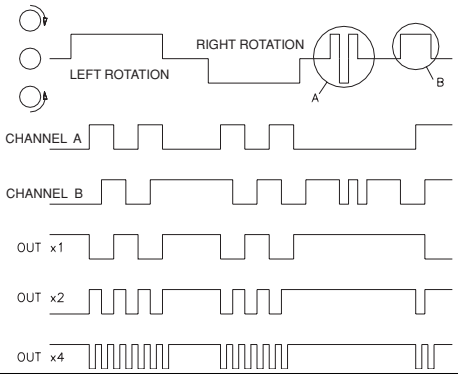


Torque	0,5 Ncm
Maximum speed	5000 r.p.m.
Moment of inertia	50gr. cm^2
Angular acceleration	2000 rad/sec^2
Axial load	30N
Radial load	34N
Working temperature	0-50°C
Relative humidity	95% non condensing
Case	Anodised aluminium flange. Cover in self-extinguishing plastic
Grade of protection	IP65
Mechanical life	10^9 turns
Weight	300 g

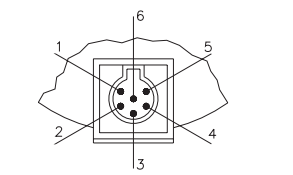
GENERAL DATA

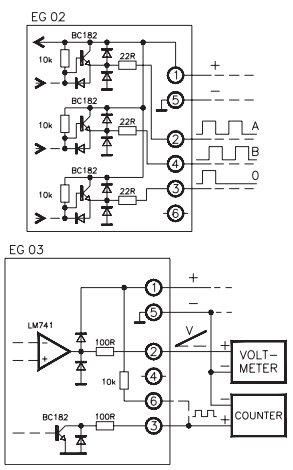
The output signals from channel A and B are rectangular waveforms with 50% duty cicle.
he two channels are 1/4 period out of phase or 90° electrically. The two signals enable detection of the direction of rotation, by observing the time sequence of the output pulses. In pratical industrial applications, the presence of vibration can create problems with monodirectional encoders.
The method usually employed to avoid incertainty is to design an hysteresis on the switch point level with internal logic.
This type of hysteresis could be called “analogue” since it operates on the amplitude of the output signal, and it is present on any type of optical encoder.
The EG01 not only employes “analogue” hysteresis, but uses another original type of hysteresis.
It uses the second channel to obtain the largest possible hysteresis with a logic discrimination, which is 90° electrically.
A larger width would mean loss of information, since it would be larger than the resolution of the encoder and would thus mask an output pulse.
If N is the number of pulses per turn, then the 360° mechanically is equivalent to 360 x N degrees electrically.
Thus for an encoder with an output of 250 pulses per turn, 90° electrically is equivalent to 90/250=0.36 degrees mechanically.
This means that no new output pulse can occur until the encoder shaft is rotated more than 0.36°.
The following diagram illustrates the behaviour in the case of vibration that is less than or greater than 90° electrically (cases A and B respectively).
The x2 and x4 outputs of the encoder allow the resolution of the system to be correspondingly increased.
Both outputs have the property of hysteresis.

The x2 output is a logic combination of channels A and B, while the x4 output is a 60 microsecond pulse triggered by each leading and trailing edge of the pulse train obtained in the x2 output.
In the latest case, to avoid overlapping of the pulses, it is not possible to exceed a frequency of 5 kHz (1.2 kHz at the input).



ELECTRICAL CONNECTIONS





EG 01
1+/ 5- Supply
2 x2 output
3 Not connected
4 x4 output (max. fre. 5 kHz)
6 x1 output

EG 02
1+/ 5- Supply
2 Channel A
3 Zero reference signal
4 Channel B
6 Not connected
* The channel A is present for the monodirectional version

EG 03
1+/ 5- Supply
2 Analog output
1V/1000 turns for scales 2-5
1V/100turns for scale 1
3 Open collector output of encoder frequency
4 Not connected
6 Pull-up resistance for open collector (10kOhm connected internally to + V supply)

OPTIONAL ACCESSORIES

	Code
Mating connector	**CON 801**
Flexible joint	**GIU 000**

ORDER CODE

EG ☐☐☐☐☐☐☐

MODEL	
Monodirectional with position hysteresis	**EG01**
Mono/Bidirectional zero reference output	**EG02**
Tachometer	**EG03**

SCALE (EG03 only)	
1 to 200 r.p.m.	**1**
2 to 2000 r.p.m.	**2**
5 to 5000 r.p.m.	**5**

SUPPLY	
5Vcc (EG01/EG02)	**A**
8-24Vcc (EG01/EG02)	**B**
11-25Vcc (EG03)	**---**

OUTPUT (EG02 only)	
Monodirectional	**M**
Bidirectional	**B**

NR of pulses/rev (EG01/EG02 only)	
60 pulses/rev	**60**
100 pulses/rev	**100**
200 pulses/rev	**200**
240 pulses/rev	**240**
250 pulses/rev	**250**

CONNECTOR	
With radial outlet	**R**
With axial outlet	**A**

ZERO REF. SIGNAL (EG02 only)	
With zero indication	**Z**
Without zero indication	**---**

GEFRAN spa
via Sebina, 74
25050 PROVAGLIO D’ISEO (BS) - ITALIA
tel. 0309888.1 - fax. 0309839063
Internet: http://www.gefran.com
www.gefranonline.com

UNI EN 29001 - ISO 9001
Certificato nr. 9115.GEF1

cod. 84961-08/01