

Compatibility for EMC, climate and mechanical load



for drivers, axis cards, transducers and sensors

Electronic drivers, axis cards and transducers are the most critical valve components concerning the risk of electromagnetic interferences, water entrance and mechanical stress. As per applicable International Standards, the following tables summarize the environmental resistance features of Atos industrial electronic devices:

- on-board and off-board drivers
- on-board and off-board axis cards
- LVDT and pressure transducers
- inductive position switch and inductive proximity sensors

1 EMC ELECTROMAGNETIC COMPATIBILITY according to Directive 2014/30/UE

The EMC Directive identifies the ability of a device, equipment or system to function in an electromagnetic environment in a satisfactory manner (immunity), without produce intolerable electromagnetic interferences into any equipment in same environment (emission).

	CEI EN 61000-6-2	Immunity for industrial environments
	CEI EN 61000-6-3	Emission standard for residential, commercial and light-industrial environments
	CEI EN 61000-6-4	Emission standard for industrial environments

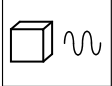
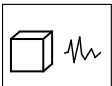

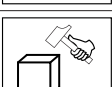


2 IP INGRESS PROTECTION CLASSIFICATION according to CEI EN 60529

IP (Ingress Protection) coding system indicates the degree of protection provided by an enclosure against access to hazardous parts, against ingress of solid foreign objects, ingress of water and to give additional information in connection with such protection. The minimum ensured IP protection reported for each component is intended with relevant connectors correctly installed.

Ingress Protection	Protection against solid objects	Protection against liquids penetration
IP20	2 = protected against solid bodies of superior dimensions to 12 mm; protect against the access with a finger	0 = not protect
IP65	6 = totally protect against the powder; protect against the access with a wire	5 = protect against water jets
IP66		6 = protect against powerful water jets
IP67		7 = protect against the effects of temporary immersion

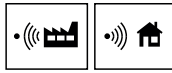
3 MECHANICAL RESISTANCE TEST CONDITIONS according to CEI EN 60068-2-6 (Vibrations, Sine & Random) - CEI EN 60068-2-27 (Shock)

The Mechanical Resistance test determines the ability of components, equipment and other articles to withstand specified severities of sinusoidal/random vibration and shock.

	Sine test	10 cycles 5-2000-5 Hz with logarithmic frequency variation 1 Octave/min 5-57 Hz amplitude 1.5 mm (p-p) 57-2000 Hz acceleration 10 g Tested on three axes X, Y, Z
	Random test	20-2000 Hz Spectral acceleration density 0.05 g ² / Hz Testing time 30 min. each axis Tested on three axes X, Y, Z
	Shock test	Half sine wave shock 50 g / 11 ms Three tests for each axis, in positive and negative direction, for a total of 18 individual shocks Tested on three axes X, Y, Z
	Shock test	Half sine wave shock 30 g / 11 ms Three tests for each axis, in positive and negative direction, for a total of 18 individual shocks Tested on three axes X, Y, Z
	Sine test (old procedure)	0 ÷ 63 Hz; 0,7 ÷ 6 g
	Shock test (old procedure)	Shock 50 g; impact time 11 ms

Ingress Protection:
IP66 / IP67

EMC:

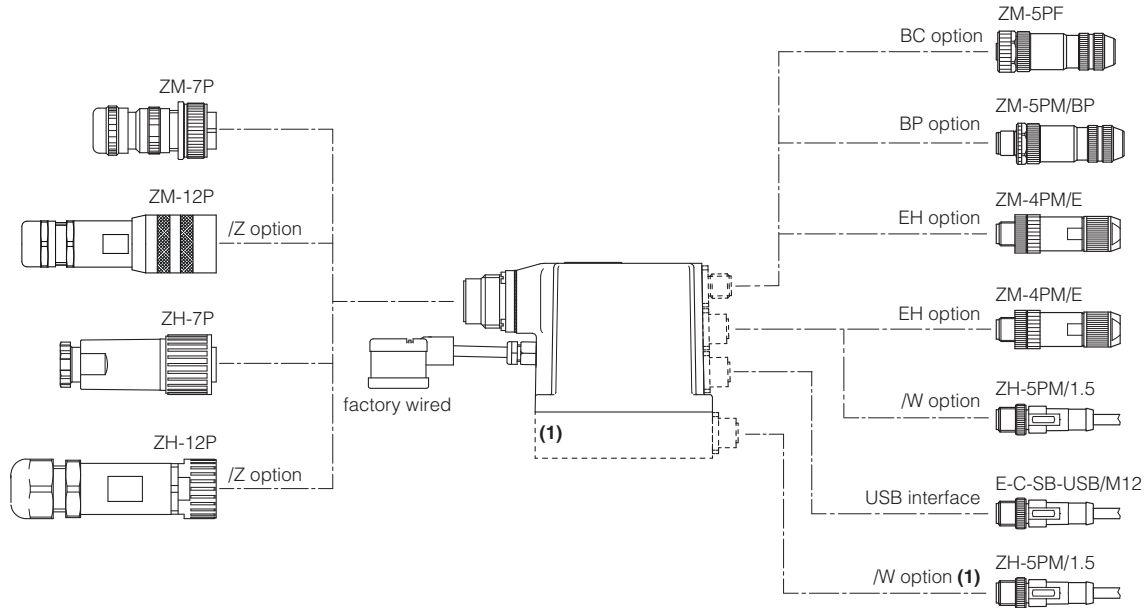
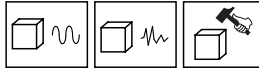


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

- above data refer to the electronics only and may differ from those indicated in the technical table of the valve, which shows complete product data
- the use of metallic connectors is strongly recommended in order to fulfill EMC requirements
- **(1)** only for EH execution

Directional valves:

- DHZO-AE*** technical table FS160
- DKZOR-AE*** technical table FS160
- DPZO-AE*** technical table FS170

Pressure valves:

- RZMO-AE*-010** technical table FS007
- RZMO-AE*-030** technical table FS065
- AGMZO-AE*** technical table FS035
- RZGO-AE*-010** technical table FS015
- RZGO-AE*-033** technical table FS070
- AGRCZO-AE*** technical table FS050
- LI*ZO-AE*** technical table FS300
- DHRZO-AE*** technical table FS025

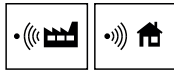
Flow valves:

- QVHZO-AE*** technical table FS410
- QVKZOR-AE*** technical table FS410

Ingress Protection:

IP66 / IP67

EMC:

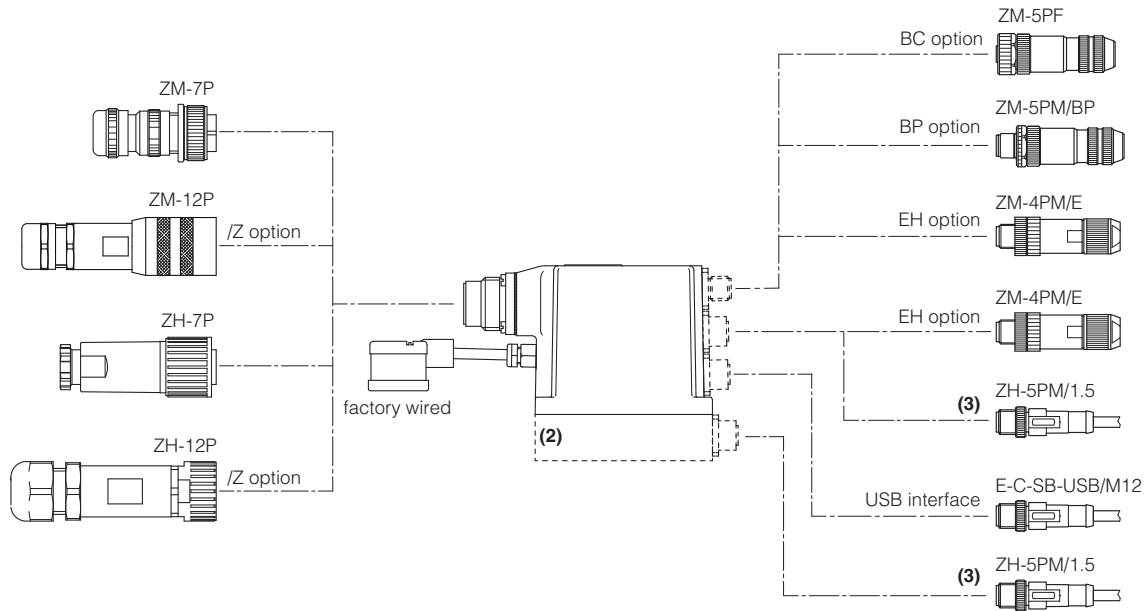
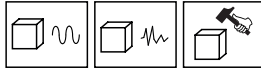


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

- above data refer to the electronics only and may differ from those indicated in the technical table of the valve, which shows complete product data
- the use of metallic connectors is strongly recommended in order to fulfill EMC requirements
- (2) only for EH execution
- (3) remote pressure transducer connector available only for REB-N and RES-N (see tech. table TFS100)

High performance pressure valves:

- RZMO-RE*-010** technical table FS010
- RZMO-RE*-030** technical table FS067
- AGMZO-RE*** technical table FS040
- RZGO-RE*-010** technical table FS020
- RZGO-RE*-033** technical table FS075
- AGRCZO-RE*** technical table FS055
- LI*ZO-RE*** technical table FS305

High performance pressure valves, with remote pressure transducer:

- RZMO-RE*-N** technical table TFS100
- AGMZO-RE*-N** technical table TFS100
- LIMZO-RE*-N** technical table TFS100
- LICZO-RE*-N** technical table TFS100

Ingress Protection:
IP66 / IP67

EMC:

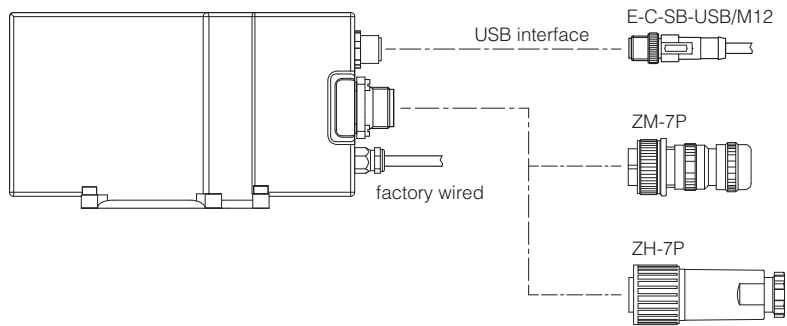
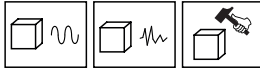


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

- above data refer to the electronics only and may differ from those indicated in the technical table of the valve, which shows complete product data
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High performance directionals:

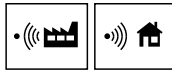
DHZE-TID technical table TFS150

DKZE-TID technical table TFS150

DPZE-TID technical table TFS170

Ingress Protection:
IP66 / IP67

EMC:

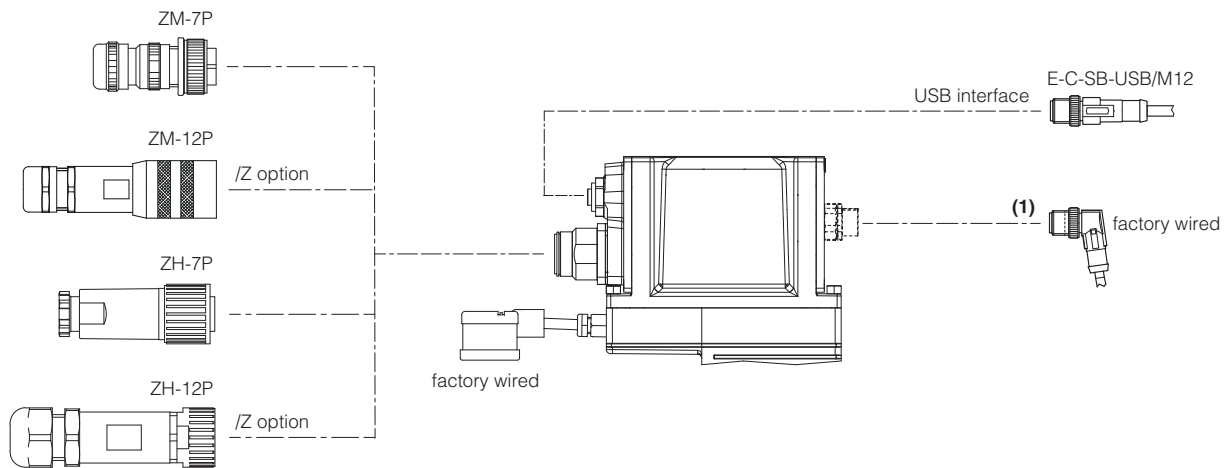
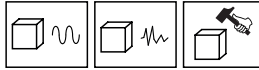


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

- above data refer to the electronics only and may differ from those indicated in the technical table of the valve, which shows complete product data
- the use of metallic connectors is strongly recommended in order to fulfill EMC requirements
- **(1)** only for piloted valves

Servoproportional directionals:

- DLHZO-TEB** technical table FS180
- DLKZOR-TEB** technical table FS180
- DHZO-TEB** technical table FS168
- DKZOR-TEB** technical table FS168
- DPZO-LEB** technical table FS178
- LIQZO-LEB** technical table FS340
- LIQZP-LEB** technical table FS340

High performance directionals:

- DHZO-TEB** technical table FS165
- DKZOR-TEB** technical table FS165
- DPZO-TEB** technical table FS172
- DPZO-LEB** technical table FS175
- LIQZO-LEB** technical table FS330
- LIQZP-LEB** technical table FS330
- LIQZO-TEB** technical table TFS325
- LIQZP-TEB** technical table TFS325
- LIQZH-LEB** technical table TFS330

Ingress Protection:
IP66 / IP67

EMC:

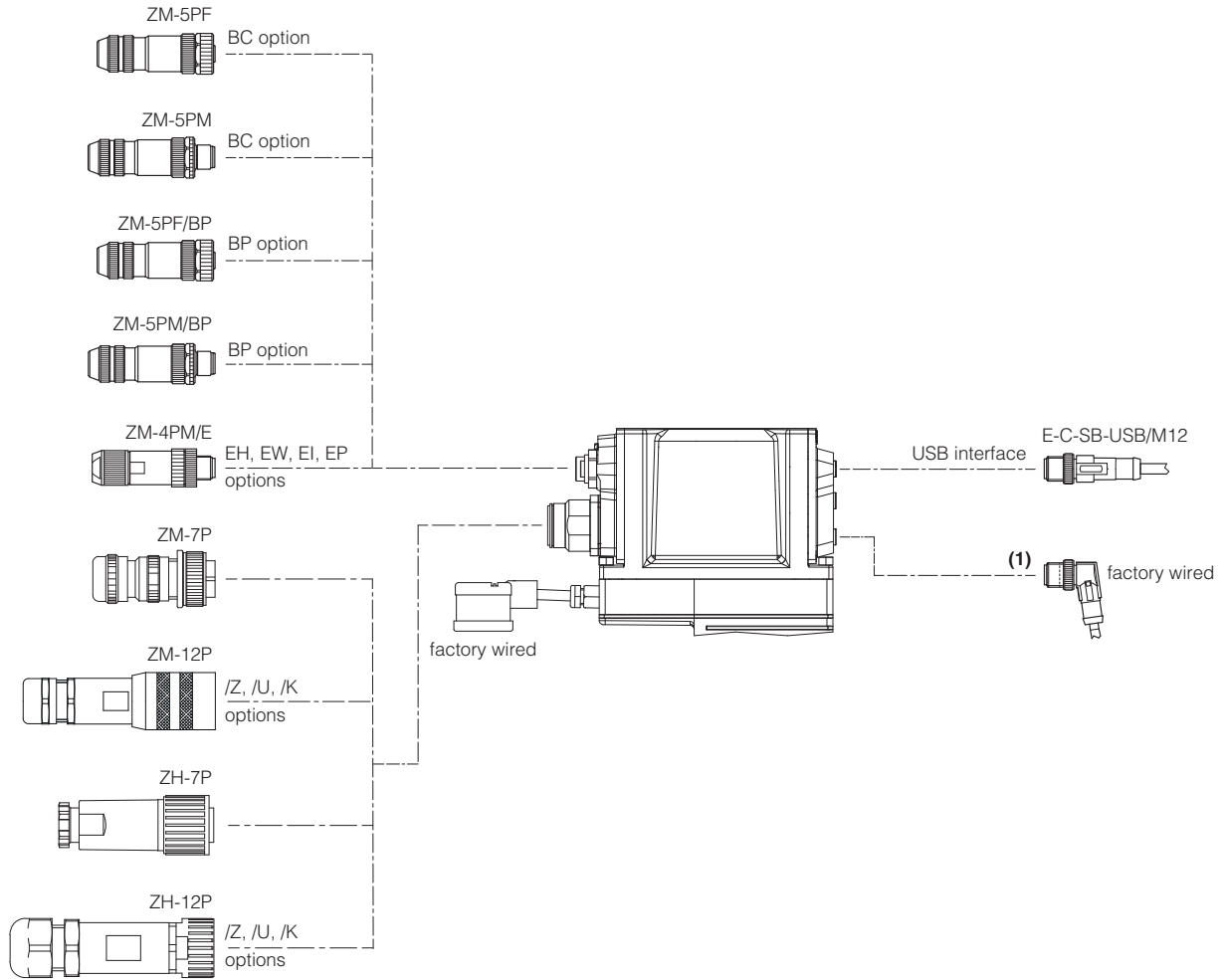
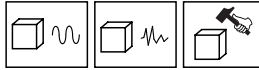


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

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- (1) only for piloted valves

Servoproportional directionals:

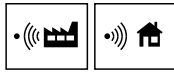
- DLHZO-LES** technical table FS180
- DLKZOR-LES** technical table FS180
- DHZO-LES** technical table FS168
- DKZOR-LES** technical table FS168
- DPZO-LES** technical table FS178
- LIQZO-LES** technical table FS340
- LIQZP-LES** technical table FS340

High performance directionals:

- DHZO-LES** technical table FS165
- DKZOR-LES** technical table FS165
- DPZO-LES** technical table FS172
- DPZO-LES** technical table FS175
- LIQZO-LES** technical table FS330
- LIQZP-LES** technical table FS330
- LIQZH-LES** technical table TFS330

Ingress Protection:
IP66 / IP67

EMC:

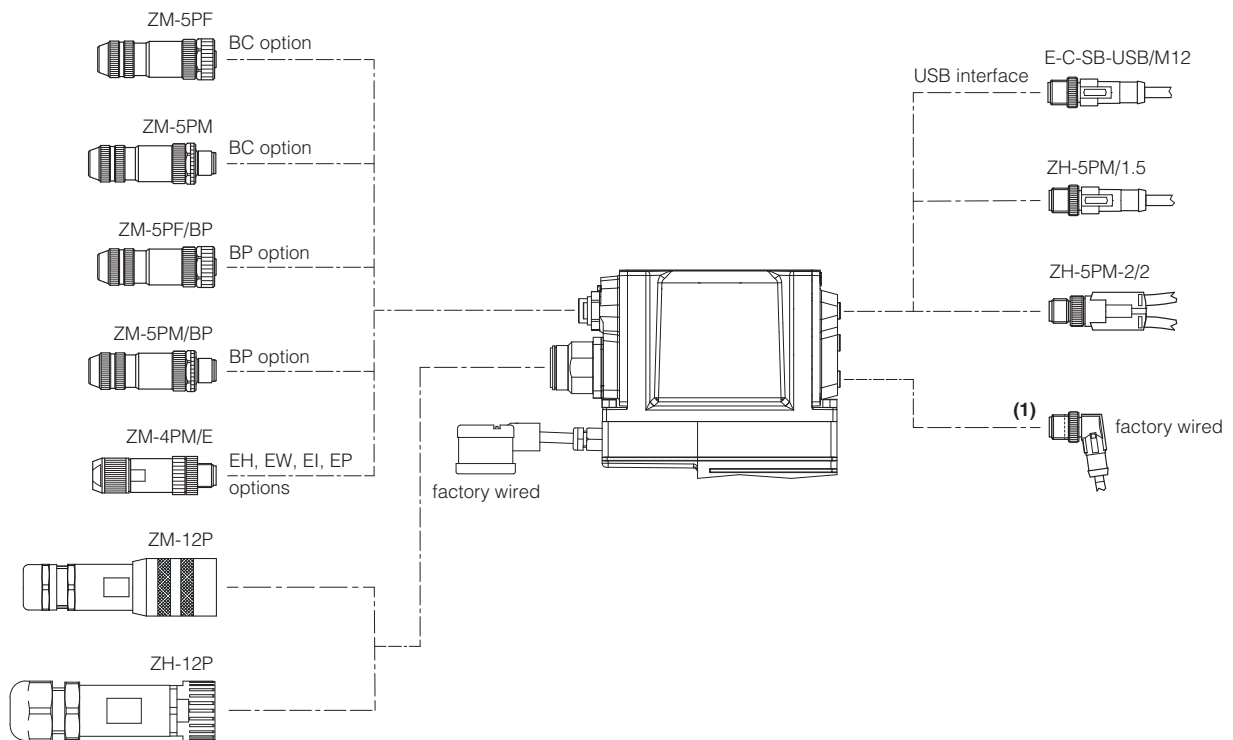
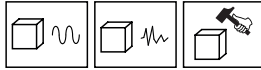


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

- above data refer to the electronics only and may differ from those indicated in the technical table of the valve, which shows complete product data
- the use of metallic connectors is strongly recommended in order to fulfill EMC requirements
- (1) only for piloted valves

Servoproportional directionals, with P/Q controls:

- DLHZO-TES** technical table FS180
- DLKZOR-TES** technical table FS180
- DHZO-TES** technical table FS168
- DKZOR-TES** technical table FS168
- DPZO-LES** technical table FS178
- LIQZO-LES** technical table FS340
- LIQZP-LES** technical table FS340

High performance directionals, with P/Q controls:

- DHZO-TES** technical table FS165
- DKZOR-TES** technical table FS165
- DPZO-LES** technical table FS175

Ingress Protection:

IP66 / IP67

EMC:

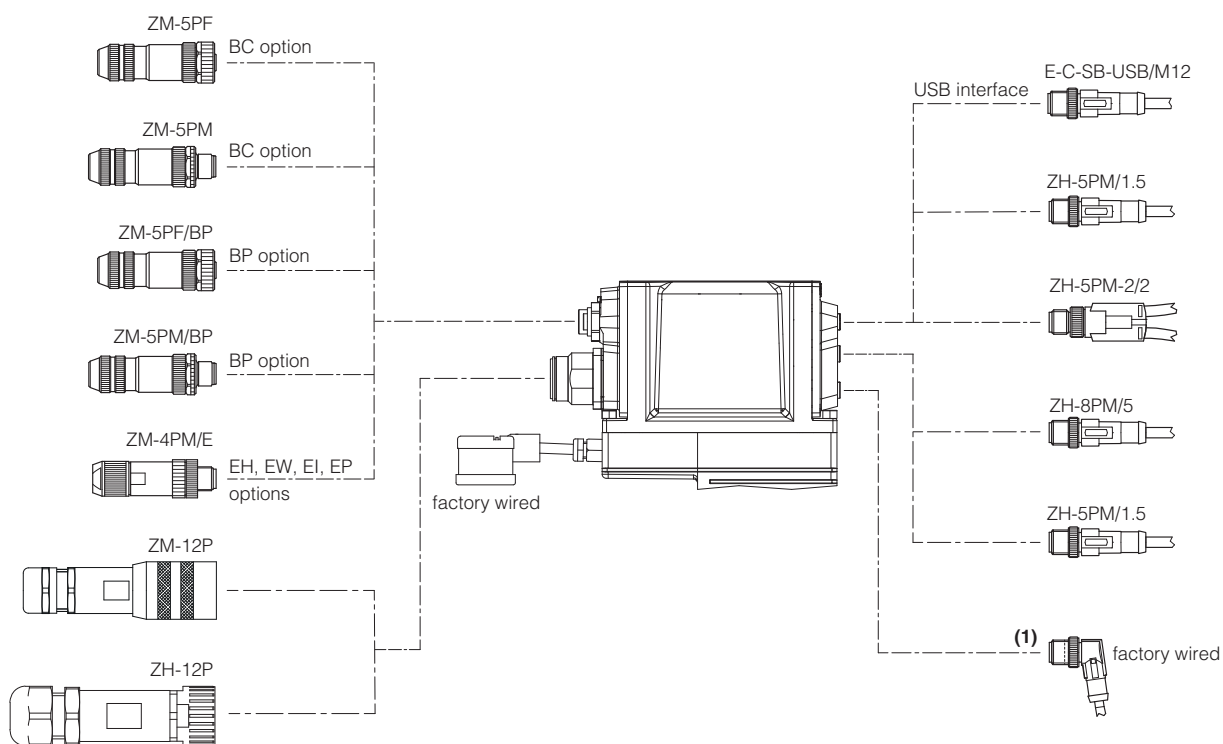


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

- above data refer to the electronics only and may differ from those indicated in the technical table of the valve, which shows complete product data
- the use of metallic connectors is strongly recommended in order to fulfill EMC requirements
- **(1)** only for piloted valves

Axis controls:

- DLHZO-TEZ** technical table FS610
- DLKZOR-TEZ** technical table FS610
- DHZO-TEZ** technical table FS620
- DKZOR-TEZ** technical table FS620
- DPZO-LEZ** technical table FS630

Ingress Protection:
IP66 / IP67

EMC:

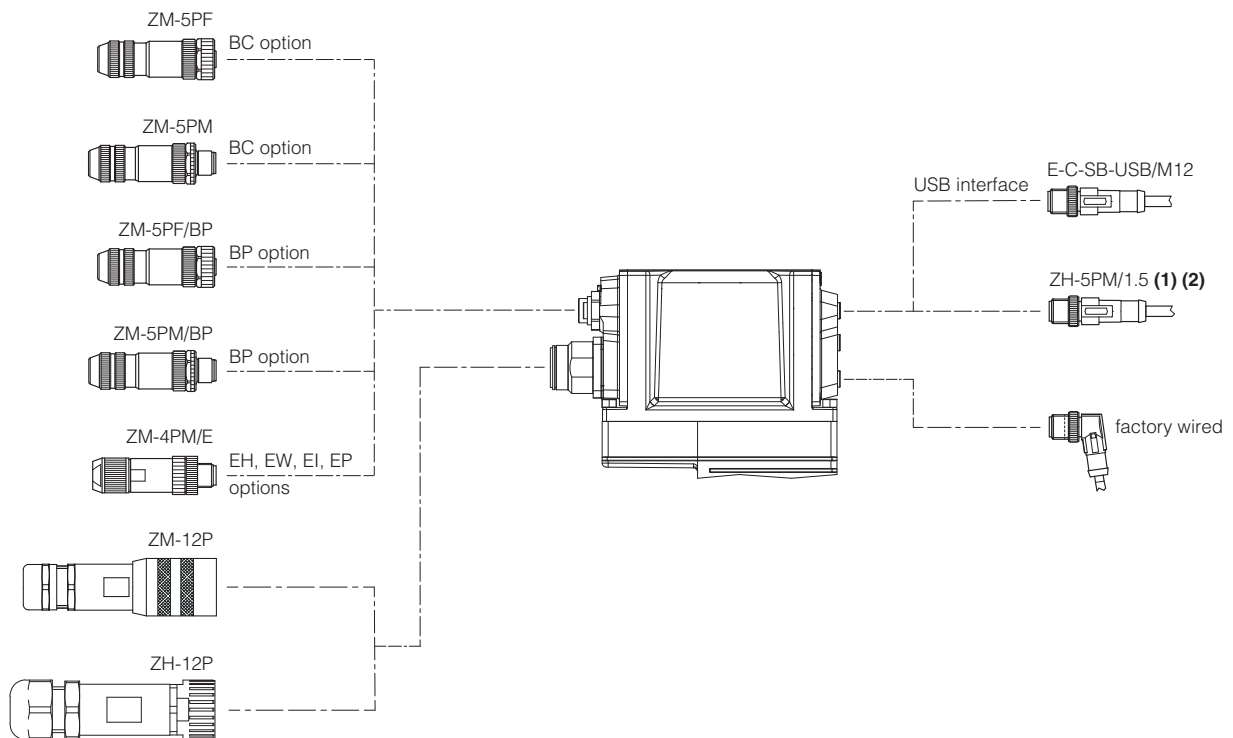
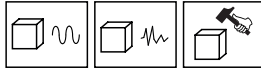


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Notes:

- above data refer to the electronics only and may differ from those indicated in the technical table of the valve, which shows complete product data
- the use of metallic connectors is strongly recommended in order to fulfill EMC requirements
- **(1)** only for /S, /X and /SX options
- **(2)** factory wired for /X and /SX options

Variable displacement pumps:

PVPC-PES technical table AS170

PVPC-PERS technical table AS170

12 E-BM-AS off-board drivers

Ingress Protection:

IP20

Temperature (1):

Ambient **-20°C ÷ +60°C**

Storage **-25°C ÷ +85°C**

(1) Ambient temperature for 05H version used for two single solenoid valves: -20°C ÷ +40°C

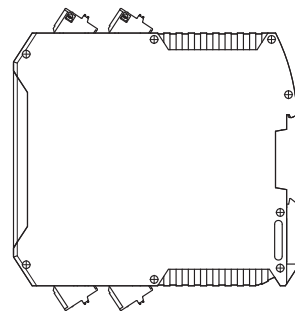
Electronics drivers:

E-BM-AS technical table G030

EMC:



Mechanical Resistance:



13 E-BM-AES, E-BM-RES off-board drivers

Ingress Protection:

IP20

Temperature:

Ambient **-20°C ÷ +60°C**

Storage **-25°C ÷ +85°C**

Electronics drivers:

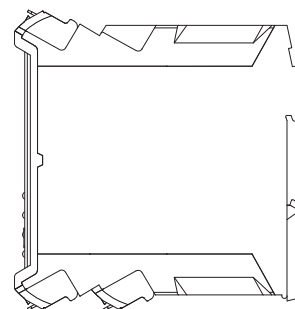
E-BM-AES technical table GS050

E-BM-RES technical table GS203

EMC:



Mechanical Resistance:



14 E-BM-TID/LID, E-BM-TEB/LEB, E-BM-TES/LES off-board drivers

Ingress Protection:

IP20

Temperature (1):

Ambient **-20°C ÷ +60°C**

Storage **-25°C ÷ +85°C**

(1) Ambient temperature for TES/LES: -20°C ÷ +50°C

Electronics drivers:

E-BM-TID/LID technical table GS235

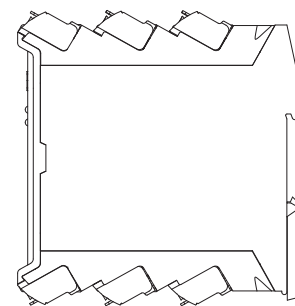
E-BM-TEB/LEB technical table GS230

E-BM-TES/LES technical table GS240

EMC:




Mechanical Resistance:

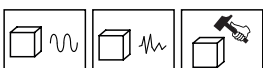


15 Z-BM-TEZ/LEZ, Z-BM-KZ off-board axis cards

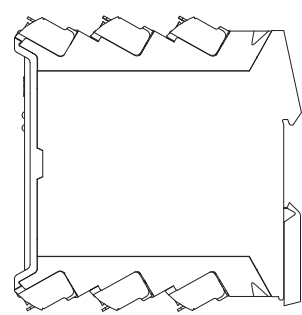
Ingress Protection:
IP20

Temperature:
Ambient **-20°C ÷ +50°C**
Storage **-25°C ÷ +85°C**

EMC:


Mechanical Resistance:



Electronics axis controls:
Z-BM-TEZ/LEZ technical table GS330
Z-BM-KZ technical table GS340




16 E-MI-AC plug-in drivers

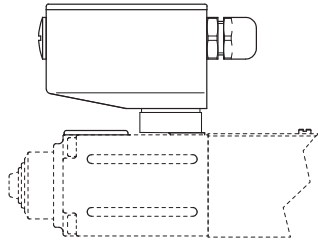
Ingress Protection:
IP65

Temperature:
Ambient **0°C ÷ +50°C**
Storage **-20°C ÷ +70°C**

EMC:


Mechanical Resistance:



Electronics drivers:
E-MI-AC technical table G010

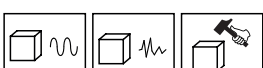


17 E-MI-AS-IR plug-in drivers

Ingress Protection:
IP65

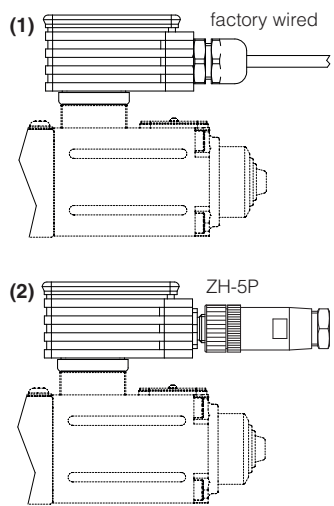
Temperature:
Ambient **-20°C ÷ +50°C**
Storage **-25°C ÷ +85°C**

EMC:


Mechanical Resistance:


Electronics drivers:
E-MI-AS-IR technical table G020

(1) Standard version - with 5 m cable
(2) /M12 option - with 5 poles M12 connector



18 E-THTZE-4 LVDT transducers

Ingress Protection:

IP66 / IP67

EMC:



Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:

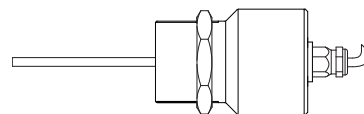


Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

High performance directionals:

DHZE-TID technical table TFS150

DKZE-TID technical table TFS150



19 E-THT-4 LVDT transducers

Ingress Protection:

IP66 / IP67

EMC:

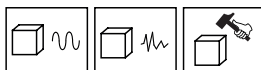


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Servoproportional directionals:

DLHZO-TE* technical table FS180

DLKZOR-TE* technical table FS180

DHZO-TE* technical table FS168

DKZOR-TE* technical table FS168

DPZO-LE* technical table FS178

LIQZO-LE* technical table FS340

LIQZP-LE* technical table FS340

High performance directionals:

DHZO-TE* technical table FS165

DKZOR-TE* technical table FS165

DPZO-LE* technical table FS175

LIQZO-LE* technical table FS330

LIQZP-LE* technical table FS330

LIQZH-LE* technical table TFS330

Axis controls:

DLHZO-TEZ technical table FS610

DLKZOR-TEZ technical table FS610

DHZO-TEZ technical table FS620

DKZOR-TEZ technical table FS620

DPZO-LEZ technical table FS630

Flow valves:

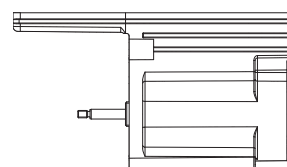
QVHZO-TE* technical table FS412

QVKZOR-TE* technical table FS412

Variable displacement pumps:

PVPC-PES technical table AS170

PVPC-PERS technical table AS170



20 4-ETH LVDT transducers

Ingress Protection:

IP65

EMC:

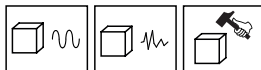


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Servoproportional directionals:

DLHZO-T technical table F180

DLKZOR-T technical table F180

DHZO-T technical table F168

DKZOR-T technical table F168

DPZO-L technical table F178

LIQZO-L technical table F340

LIQZP-L technical table F340

High performance directionals:

DHZO-T technical table F165

DKZOR-T technical table F165

DPZO-L technical table F175

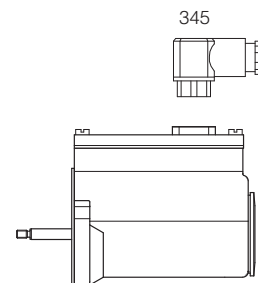
LIQZO-L technical table F330

LIQZP-L technical table F330

Flow valves:

QVHZO-T technical table F412

QVKZOR-T technical table F412



21 8-ETHR LVDT transducers

Ingress Protection:

IP66 / IP67

Temperature:

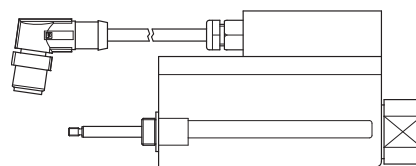
Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

EMC:



Mechanical Resistance:



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Servoproportional directionals:

DPZO-LE* size 8, technical table FS178
LIQZO-LE* technical table FS340

High performance directionals:

DPZO-LE* size 8, technical table FS175
LIQZO-LE* technical table FS330
LIQZO-TEB technical table TFS325

Axis controls:

DPZO-LEZ technical table FS630

22 8-ETH LVDT transducers

Ingress Protection:

IP66 / IP67

Temperature:

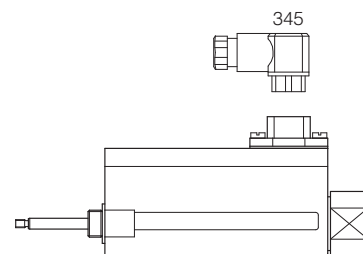
Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

EMC:



Mechanical Resistance:



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Servoproportional directionals:

DPZO-LE* size 1 to 6, technical table FS178
DPZO-L technical table F178
LIQZO-L technical table F340

High performance directionals:

DPZO-LE* size 1 to 6, technical table FS175
DPZO-L technical table F175
DPZO-TE* technical table FS172
DPZO-T technical table F172
LIQZO-L technical table F330

23 E-THT-8/M12 LVDT transducers

Ingress Protection:

IP66 / IP67

Temperature:

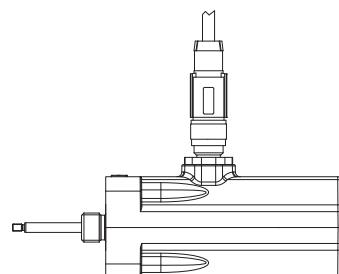
Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

EMC:



Mechanical Resistance:






Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

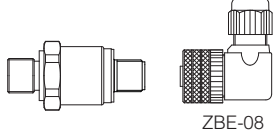
High performance directionals:


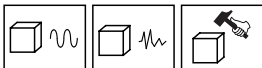
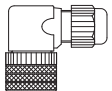
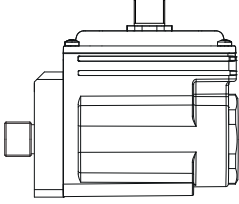
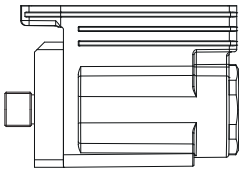
DPZE-TID technical table TFS170

24 E-THT-15 LVDT transducers

<p>Ingress Protection: IP66 / IP67</p> <p>Temperature: Ambient -40°C ÷ +60°C Storage -40°C ÷ +70°C</p> <p>Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data</p> <p>Servoproportional directionals: LIQZP-LE* technical table FS340 LIQZP-L technical table F340</p>	<p>EMC: </p> <p>Mechanical Resistance: </p> <p>High performance directionals: LIQZP-LE* technical table FS330 LIQZP-L technical table F330 LIQZP-TEB technical table TFS325 LIQZH-LE* technical table TFS330</p>	 <p>ZBE-08</p>
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25 E-ATR-8 pressure transducers

<p>Ingress Protection: IP67</p> <p>Temperature: Ambient -40°C ÷ +100°C Storage -40°C ÷ +100°C</p> <p>Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data</p> <p>Accessories: E-ATR-8 technical table GS465</p>	<p>EMC: EN 61326 emission (group 1, class B) and interference immunity (industrial application)</p> <p>Mechanical Resistance: Shock: DIN EN 60068-2-27 40 g / 6 ms / half sinusoid Vibration: DIN EN 60068-2-6 20 g / 20 ÷ 2000 Hz</p> <p>Variable displacement pumps (1): PVPC-PES technical table AS170 PVPC-PERS technical table AS170 (1) only for /X and /SX options</p>	 <p>ZBE-08</p>
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<p>Ingress Protection: IP66 / IP67</p> <p>Temperature: Ambient -40°C ÷ +100°C Storage -40°C ÷ +100°C</p> <p>Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data</p> <p>High performance pressure valves: RZMO-R*-010 technical table FS010 RZMO-R*-030 technical table FS067 AGMZO-R* technical table FS040 RZGO-R*-010 technical table FS020 RZGO-R*-033 technical table FS075 AGRCZO-R* technical table FS055 LI*ZO-R* technical table FS305</p>	<p>EMC: </p> <p>Mechanical Resistance: </p>	<p>ZBE-08</p>   <p>valves R (off-board drivers)</p>  <p>valves REB and RES (on-board drivers)</p>
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26 E-THT-FV-10 inductive position switches

Ingress Protection:

IP66 / IP67

EMC:

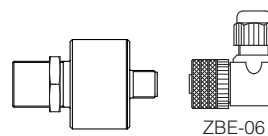


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Safety on-off directionals, single solenoid valves **(1)**:

DHI-06 technical table EY010

DHE-06 technical table EY010

DKE-16 technical table EY010

HF-0611 technical table EY050

HF-0614 technical table EY050

HF-0673 technical table EY050

JO-DL technical table EY105

DPHE technical table EY030

LIDA technical table EY120

LIDAS technical table EY120

LIDASH technical table EY120

(1) only for /FV option

27 E-THT-FV-20 inductive position switches

Ingress Protection:

IP66 / IP67

EMC:

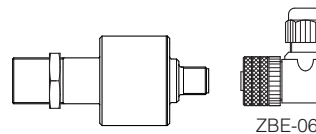
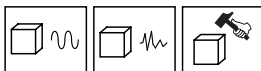


Temperature:

Ambient **-40°C ÷ +60°C**

Storage **-40°C ÷ +70°C**

Mechanical Resistance:



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Safety on-off directional, double solenoid valves **(1)**:

DHE-07 technical table EY010

DKE-17 technical table EY010

(1) only for /FV option

Ingress Protection:

IP67

EMC:

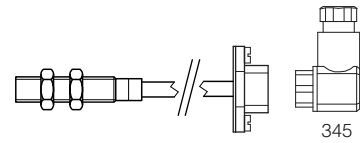
IEC 61000-4-2 level 2
IEC 61000-4-3 level 3
IEC 61000-4-4 level 2

Temperature:

Ambient **-25°C ÷ +70°C**

Mechanical Resistance:

IEC 60947-5-2 / 7.4



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Safety on-off directionals valves **(1)**:

- DHI-06** technical table EY010
- DHI-07** technical table EY010
- DHE-06** technical table EY010
- DHE-07** technical table EY010
- DKE-16** technical table EY010
- DKE-17** technical table EY010

(1) only for /FI option

Ingress Protection:

IP68

EMC:

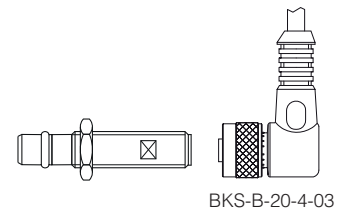
IEC 61000-4-2 level 2
IEC 61000-4-3 level 3
IEC 61000-4-4 level 3

Temperature:

Ambient **-25°C ÷ +70°C**

Mechanical Resistance:

Shock: EN 60068-2-27
Half-sinus, 30 gn, 11 ms
Vibration: EN 60068-2-6
55 Hz, amplitude 1 mm, 3x30 min



Note: above data refer to the transducer only and may differ from those indicated in the technical table of the valve, which shows complete product data

Safety on-off directionals valves **(1)**:

- LIFI** technical table EY120
- LIDA** technical table TEY120
- LIDASH** technical table TEY120

(1) only for /FI option