

Compatibility for EMC, climate and mechanical load

for valve's drivers, controllers and transducers

Electronic drivers and transducers are the most critical valve's 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 electronic devices:

- remote or integral to valve's drivers and controllers
- LVDT spool position transducers
- proximity or position inductive switches
- pressure transducers

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).

	EN 61000-6-2 (ex EN 50082-2)	Immunity for industrial environments
	EN 61000-6-3 (ex EN 50081-1)	Emission standard for residential, commercial and light-industrial environments
	EN 61000-6-4 (ex EN 50081-2)	Emission standard for industrial environments

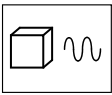
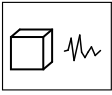
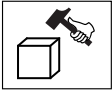
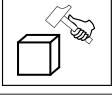
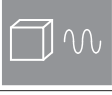

2 IP PROTECTION DEGREE CLASSIFICATION according to CEI EN 60529

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

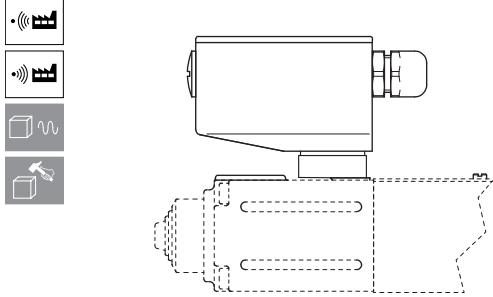
3 MECHANICAL RESISTANCE TEST CONDITIONS according to CEI EN 60068-2-6 (Vibrations, Sine & Random) - CEI EN 60068-2-27 (Shock)

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

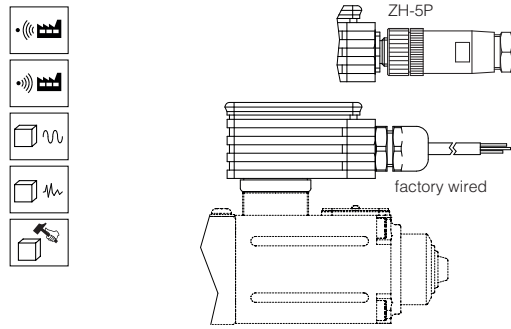
4 ELECTRONIC DRIVERS TYPE E-MI-AC analog, see table G010

minimum ensured protection **IP65**
operating temperature $0 \div +50 \text{ }^\circ\text{C}$ (storage $-20 \div +70 \text{ }^\circ\text{C}$)



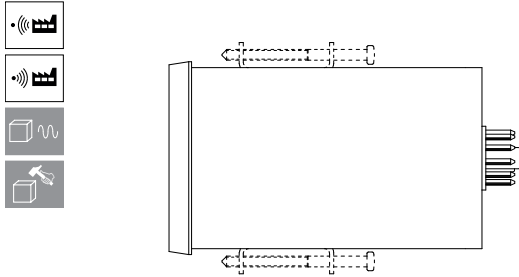
5 ELECTRONIC DRIVER TYPE E-MI-AS-IR digital, see table G020

minimum ensured protection **IP65**
operating temperature $-20 \div +50 \text{ }^\circ\text{C}$ (storage $-25 \div +85 \text{ }^\circ\text{C}$)



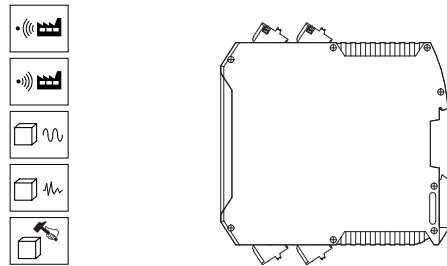
6 ELECTRONIC DRIVER TYPE E-BM-AC analog, see table G025

minimum ensured protection **IP20**
operating temperature $-10 \div +60 \text{ }^\circ\text{C}$ (storage $-20 \div +70 \text{ }^\circ\text{C}$)



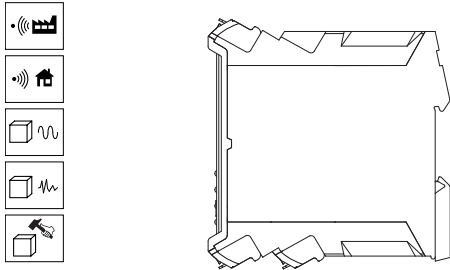
7 ELECTRONIC DRIVER TYPE E-BM-AS digital, see table G030

minimum ensured protection **IP20**
operating temperature $-20 \div +60 \text{ }^\circ\text{C}$ (storage $-25 \div +85 \text{ }^\circ\text{C}$)
operating temperature on 05H version for two single solenoid valves $-20 \div +40 \text{ }^\circ\text{C}$



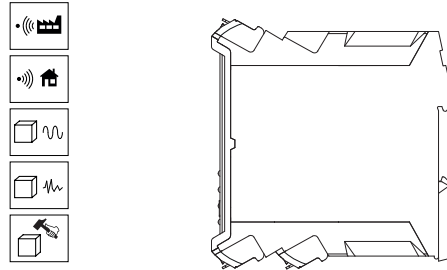
8 ELECTRONIC DRIVER TYPE E-BM-AES digital, see table GS050

minimum ensured protection **IP20**
operating temperature $-20 \div +60 \text{ }^\circ\text{C}$ (storage $-25 \div +85 \text{ }^\circ\text{C}$)



9 ELECTRONIC DRIVER TYPE E-BM-RES digital, see table GS203

minimum ensured protection **IP20**
operating temperature $-20 \div +60 \text{ }^\circ\text{C}$ (storage $-25 \div +85 \text{ }^\circ\text{C}$)

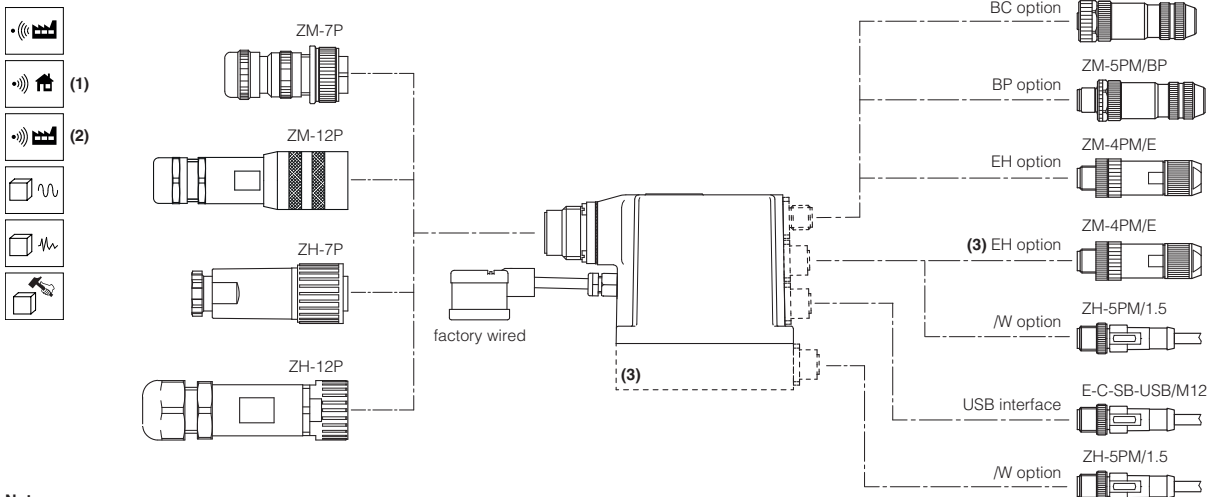


10 INTEGRAL ELECTRONIC DRIVERS TYPE

E-RI-AEB(AES) digital, see table GS115
E-RI-REB(RES) digital, see table GS205

E-RI-AE analog, see table G110

minimum ensured protection **IP67**
AE operating temperature $-20 \div +60 \text{ }^\circ\text{C}$ (storage $-20 \div +70 \text{ }^\circ\text{C}$)
AEB(AES), REB(RES) operating temperature $-40 \div +60 \text{ }^\circ\text{C}$ (storage $-40 \div +70 \text{ }^\circ\text{C}$)



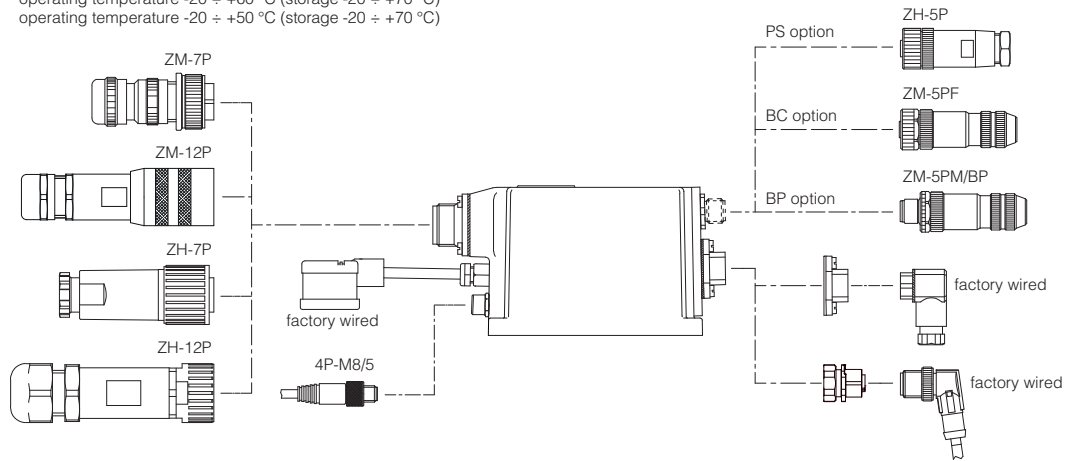
Notes:

use of metallic connectors is strongly recommended in order to fulfill EMC requirements
(1) for AEB/AES and REB/RES (2) only for AE (3) for AES and RES with EH fieldbus interface

11 INTEGRAL ELECTRONIC DRIVERS TYPE E-RI-TE(LE) analog, see table G200 E-RI-TERS(AERS) digital, see table G205

minimum ensured protection **IP67**

E-RI-TE(LE) operating temperature -20 ÷ +60 °C (storage -20 ÷ +70 °C)
 E-RI-TERS(AERS) operating temperature -20 ÷ +50 °C (storage -20 ÷ +70 °C)

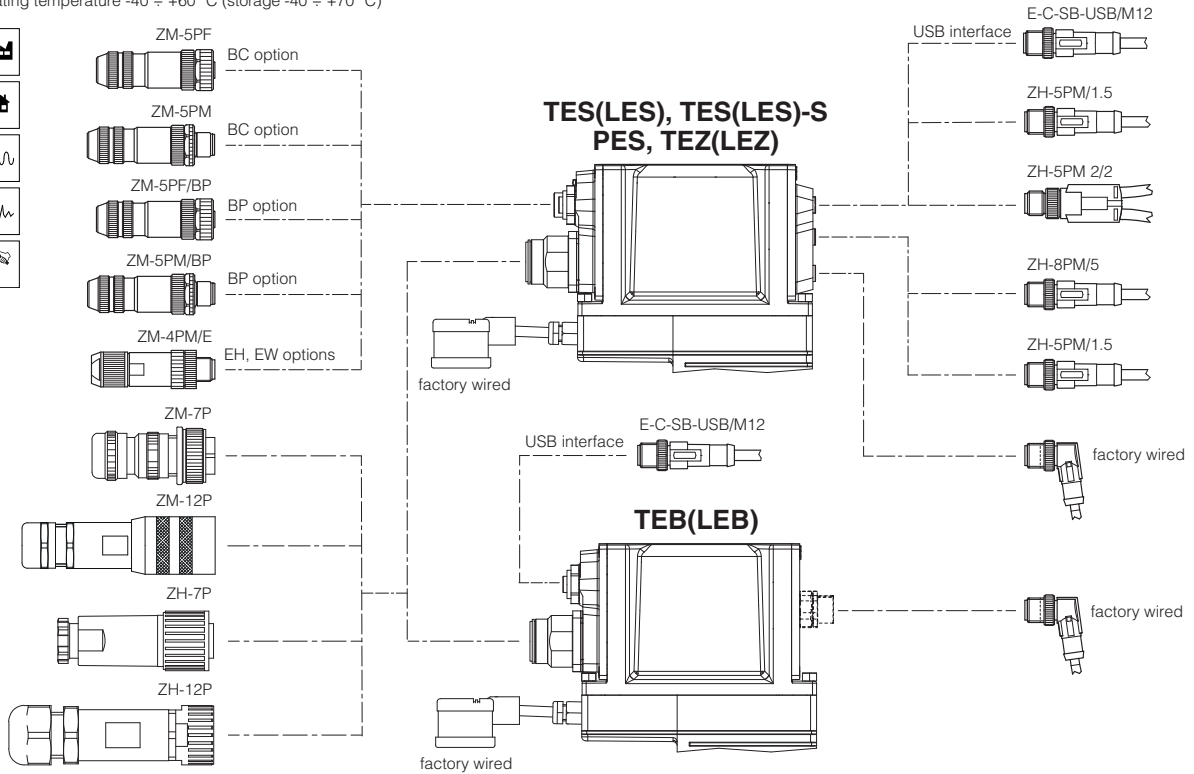
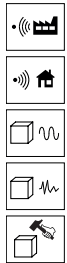


Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements

12 INTEGRAL ELECTRONIC DRIVERS/CONTROLLERS TYPE E-RI-TEB(LEB) digital, see table GS208 E-RI-TES(LES) digital, see table GS210 E-RI-TES(LES)-S digital, see table GS212 E-RI-PES digital, see table GS215 E-RI-TEZ(LEZ) digital, see table FS230

minimum ensured protection **IP66 & IP67**

operating temperature -40 ÷ +60 °C (storage -40 ÷ +70 °C)

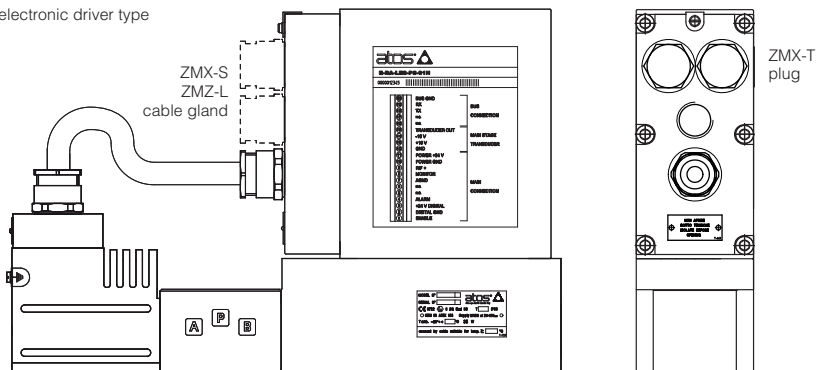
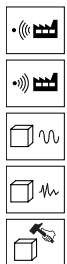


Note: use of metallic connectors is strongly recommended in order to fulfill EMC requirements


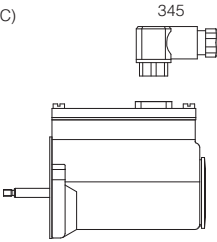

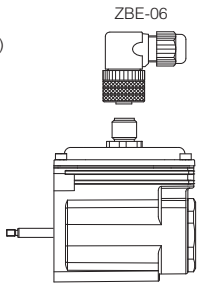
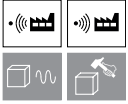
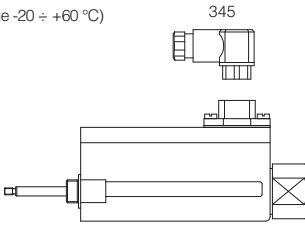
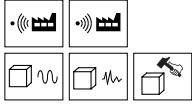
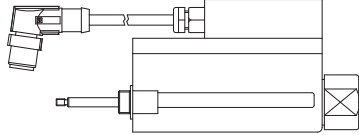
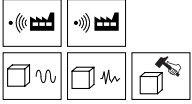

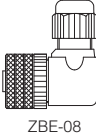
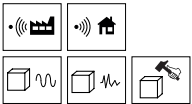
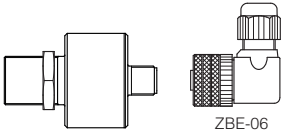

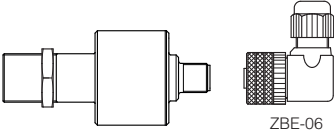
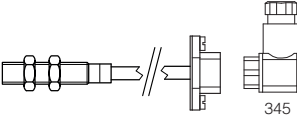
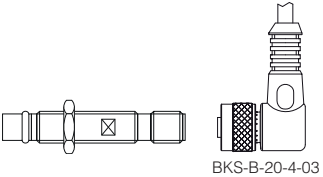
13 EX-PROOF INTEGRAL ELECTRONIC DRIVERS TYPE E-RA-AES, E-RA-TES(LES) and E-RA-TERS(AERS) digitals, see table F650

minimum ensured protection **IP66**

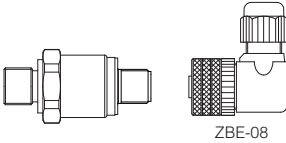

operating / storage temperature, refer to specific electronic driver type



14 VALVE'S POSITION TRANSDUCERS

<p>ETH*-4 (only for T valves) minimum ensured protection IP65 operating temperature $-20 \div +70$ °C (storage $-20 \div +60$ °C)</p>   <p>Applied to valves: DHZO, DKZOR, see table F165 DLHZO, DLKZOR, see table F180 QVHZO, QVKZOR, see table F412</p>	<p>E-THT-4 (only for T valves) minimum ensured protection IP67 operating temperature $-40 \div +60$ °C (storage $-40 \div +70$ °C)</p>   <p>Applied to valves: DHZO, DLHZO, QVHZO DKZOR, DLKZOR, QVKZOR</p>
<p>ETH*-8 minimum ensured protection IP67 operating temperature $-20 \div +70$ °C (storage $-20 \div +60$ °C)</p>   <p>Applied to valves: DPZO-T*, see table FS172 and F172 DPZO-L*, see table FS175 and F175</p>	<p>ETHR*-8 minimum ensured protection IP67 operating temperature $-20 \div +70$ °C (storage $-20 \div +60$ °C)</p>   <p>Applied to cartridges: LIQZO-L* 2-way, size 16 to 40, see table FS330 LIQZO-L* 3-way, size 25 to 40, see table FS340</p>
<p>E-THT-15 minimum ensured protection IP67 operating temperature $-40 \div +70$ °C (storage $-40 \div +70$ °C)</p>    <p>Applied to valves: LIQZP-L (LEB, LES) 2-way, size 50 to 100, see table FS330 LIQZP-L (LEB, LES) 3-way, size 50 to 80, see table FS340</p>	
<p>E-THT-FV-10 (/FV option) minimum ensured protection IP67 operating temperature $-40 \div +60$ °C (storage $-40 \div +70$ °C)</p>   <p>Applied to valve: DHI-06, DHE-06, DKE-16, see table ES010 DPH*-16*, DPH*-26*, DPH*-46*, see table ES030 LIDA*, LIDAS*, see table ES120 JO-DL, see table ES100</p>	<p>E-THT-FV-20 (/FV option) minimum ensured protection IP67 operating temperature $-40 \div +60$ °C (storage $-40 \div +70$ °C)</p>   <p>Applied to valve: DHE-07, DKE-17, see table ES010 DPH*-17*, DPH*-27*, DPH*-47*, see table ES030</p>
<p>/FI option - valves minimum ensured protection IP67 operating temperature $-25 \div +70$ °C</p> <p>EMC: IEC 60255-5 1kV IEC 61000-4-2 level 2 IEC 61000-4-3 level 3 IEC 61000-4-4 level 3</p> <p>Shocks and vibration: IEC 60947-5-2 / 7.4</p> <p>Applied to valves: DHI, DHE, DKE, see table ES010</p> 	<p>/FI option - cartridges minimum ensured protection IP67 operating temperature $-25 \div +80$ °C</p> <p>EMC: IEC 60947-5-2 (7.2.3.1) 1kV IEC 61000-4-2 level 2 IEC 61000-4-3 level 3 IEC 61000-4-4 level 3</p> <p>Shocks and vibration: IEC 60947-5-2 / 7.4</p> <p>Applied to cartridges: LIFI, see table ES120</p> 

15 VALVE'S PRESSURE TRANSDUCERS

<p>E-ATR-8, see table GS465 minimum ensured protection IP67 operating temperature $-40 \div +100$ °C (storage $-40 \div +100$ °C)</p> <p>EMC: EN 61326 emission (group 1, class B) and immunity (industrial application)</p> <p>Shock test: max 40g / 6ms</p> <p>Vibration 20...2000Hz: max 20g</p> <p>Applied to valves: REB, RES with integral electronics</p> 	<p>E-ATRA-7, see table GX800 minimum ensured protection IP67 ambient temperature: $-40 \div +60$ °C (T6); $-40 \div +75$ °C (T5); $-40 \div +102$ °C (T4) compensated temperature: $0 \div +80$ °C</p> <p>EMC: EN 61326 emission (group 1, class B) and immunity (industrial application)</p> <p>Shock test: max 1000g</p> <p>Vibration: max 20g</p> <p>Applied to valves: TERS with ex-proof integral electronics</p> 
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