

Instruction Manual

Control Panels

EJB* / EJBX*

Pepperl+Fuchs GmbH
Lilienthalstrasse 200
69307 Mannheim, Germany
Tel. +49 621 776-0
Fax +49 621 776-1000

Document No.: DOCT-5078E
Edition: 09/2021



Validity

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel.

Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismantling of the device. The trained and qualified personnel must have read and understood the instruction manual.

Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas.

The corresponding datasheets, manuals, declarations of conformity, EC-type-examination certificates, certificates, and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

Intended Use

The enclosure series EJB forms the optimal basis for the application-specific configuration of terminal boxes, control stations as well as control and distribution panels. The enclosures are certified Ex d IIB+H₂ and Ex tb as well as „explosion-proof“. They are available in many sizes, a wide range of operating elements and monitoring functions can be integrated.

They are manufactured from copper-free aluminum with increased corrosion resistance or from high-quality stainless steel. This durability as well as the flexible customization options cover the requirements of many industries including offshore and marine applications.

A choice of windows allows viewing of integrated monitoring functions. Electrical components can be integrated as per customer specification.

Mounting and Installation

Observe the installation instructions according to IEC/EN 60079-14.

If you intend to install the device or enclosure in areas that may be exposed to aggressive substances, ensure that the stated surface materials are compatible with these substances. If required, contact Pepperl+Fuchs for further information.

ENG

If other solid obstacles are present outside the enclosure, the minimum distances between the flamepath of the enclosure and these obstacles are defined in IEC/EN 60079-14.

Product certification allows the distance to be less than specified in IEC/EN 60079-14:

- gas group IIA: = 10 mm
- gas group IIB: = 10 mm
- gas group IIB+H₂: = 10 mm

If mounting the enclosure on concrete use expansion anchors. When mounting the enclosure to a steel framework use vibration resistant mounting material.

Protect the device against long-term or excessive mechanical vibrations.

Observe the following points when installing cable glands:

- Only use cable glands that are suitably certified for the application.
- Only use cable glands with a temperature range appropriate to the application.
- Ensure that the degree of protection is not violated by the cable glands.

For control panels with IECEx certification, only use cable glands with metric thread or NPT thread.

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

Ensure that the degree of protection is not violated by the cable glands and the stopping plugs.

Close all unused enclosure holes with the appropriate stopping plugs.

The enclosure cover is heavy. In order to avoid personal injuries or property damage, make appropriate provisions for the mounting procedure.

Do not damage the flamepath surfaces between enclosure and enclosure cover during the opening of the control panel.

If one of the flamepath surfaces is damaged, exchange enclosure and enclosure cover.

Do not add additional components into the control panel, which are not listed in the original bill of materials.

Before fixing the enclosure cover to the enclosure, protect the flamepath surfaces with a thin layer of suitable protective grease.

Ensure that all fasteners are present.

When the enclosure cover is fitted, ensure that all fasteners are fully tightened.

When enclosure and cover are connected by hinges make sure all hinge screws are fully tightened before moving the cover.

When enclosure and cover are connected by hinges open the cover only for short time periods.

The delivered control panel is completely wired. Do not modify or manipulate this control panel. Observe the wiring diagram when connecting the control panel.

Ensure that external ground connections exist, are in good condition, and are not damaged or corroded.

In order to minimize power dissipation, observe the maximum possible conductor lengths.

If radio frequency sources are present in the device, the usage of the device is bound to local restrictions. Ensure that the local restrictions allow usage of this device before commissioning.

Associated Apparatus / Intrinsically Safe Circuits

- When the control panel is equipped with an associated apparatus with intrinsically safe circuits and the panel is in addition equipped with a thermal probe for protecting the I.S. apparatus against ambient temperatures where it is not designed for, this thermal probe has to be connected to either an internal or external switch which switches OFF the power for the I.S. apparatus in case the temperature inside of the panel reaches the upper or lower thresholds of the I.S. apparatus. If an external temperature switch is used, the user has to configure the settings of that switch according to the following rules:
 - Maximum temperature response threshold of [(TIE-2) ±2°C] TIE = Maximum value of the certified ambient temperature of the internal I.S. apparatus.
 - Minimum temperature response threshold of [(TminEx+2) ±2°C] TminEx = minimum value of the certified ambient temperature of the internal I.S. apparatus.

Schedule of Limitations

The enclosures provided with windows have been assessed and tested to be used in the range of operating temperatures from -52.5 °C to +180 °C. Operating temperatures are not to be confused with ambient temperatures which are significantly lower.

The width of the flameproof joints is superior to those specified in the tables of EN/IEC 60079-1.

The equipment installed inside the enclosure may be placed in any arrangement provided a minimum of 40% (for gas group IIB+H₂) respectively 20% (for gas group up to IIB) of each cross-sectional area remains free to permit an unimpeded gas flow and, therefore, unrestricted dispersion of the explosion.

Operation, Maintenance, Repair

Observe IEC/EN 60079-17 for maintenance and inspection.

The device must be disconnected from the power supply prior to installation and maintenance. The power supply may be activated only after all the circuits required for operation have been fully assembled and connected.

If the control panel was affected by a short circuit, check the following.

Check the functionality of the control panel.

Check that the integrity of the flameproof enclosure is present.

If the enclosure is damaged, replace enclosure and enclosure cover.

Check all surfaces of the flamepath for damage. If an actuator is present, check the flamepaths of the actuator for damage.

If the surfaces of the flamepath are damaged, replace the enclosure and the enclosure cover. If the surfaces of the flamepath of an actuator are damaged replace the complete actuator.

Do not paint or varnish the surfaces of the flamepath.

If the protective grease on the surfaces of the flamepath has become old, remove the protective grease and fat with new suitable protective grease.

Enclosures with degree of protection IP66/67 have seals in the flamepath.

Ensure that all seals are clean, undamaged, and correctly fitted.

Do not paint or varnish the threaded joints.

Control all threaded joints for damage.

Only use screws with a defined minimum yield stress for closing the enclosure cover.

If there is a defect, always replace the device with an original device.

Safety-relevant markings are found on the nameplate supplied. Ensure that the nameplate is present and legible. Take the ambient conditions into account.

If the internal equipment contains a battery and a potentially explosive atmosphere is present, do not open the enclosure.

If the device is installed in potentially explosive dust atmosphere, remove dust layers which exceed 5 mm in regular intervals.

Avoid electrostatic charges which could result in electrostatic discharges while installing, operating, or maintaining the device.

If cleaning is necessary while the device is located in a hazardous area, in order to avoid electrostatic charging only use a clean damp cloth.

Do not modify or manipulate the device.

Modifications are permitted only if approved in this instruction manual.

Type Code / Model Number

Enclosure type	
EJB	enclosure Ex d IIB+H ₂
Material	copper-free aluminum
X	stainless steel
Enclosure size	
0 ... 20A	see dimensions data table
Window	
W ...	no window
WG ...	rectangular window with type indication
	circular window with type indication
Electrical circuits	
D	without intrinsically safe circuits
I	intrinsically safe circuits integrated
Type of application	
U	empty enclosure
T	terminal box
CP	control panel
CS	control station
DB	distribution board
DMT	electronic earthing system
MS	motor starter
PS	power switching
RIO	remote I/O field unit
IFS	interface solution
FJB	fieldbus solution
OS	optical solution
Q40	engineered solution per customer specification (Q40)
Variant number	-Yxxxxxx

EJB	17Q	.W1	.D	.CP	-Yxxxxxx
-----	-----	-----	----	-----	----------

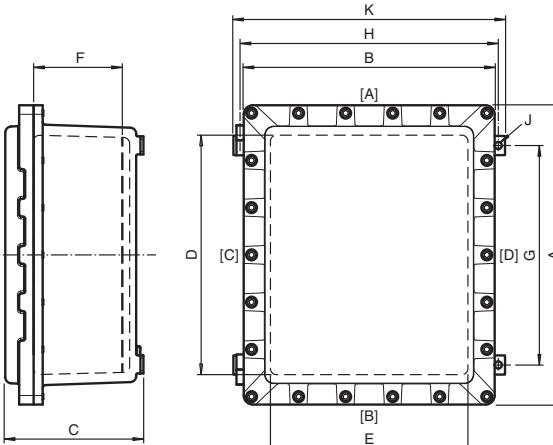
Example: Control panel EJB size 17Q in aluminum, rectangular window type 1, without intrinsically safe circuits

Technical Specifications

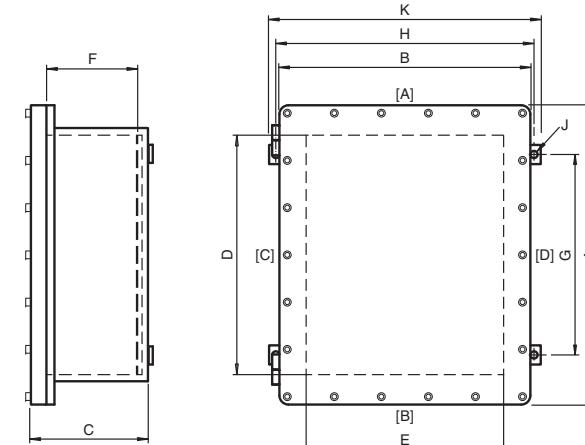
General	
Type and variants	EJB*, see type code table EJBX*, see type code table
Electrical specifications	
Operating voltage	1500 V DC / 1000 V AC max. for ATEX / IECEx 600 V AC / DC max. for North American approvals
Operating current	recommended 1600 A max.
Mechanical specifications	
Dimensions	see data table, values might differ slightly due to manufacturing tolerances dimensions are valid for standard enclosures and IP66 variants only
Thread type	metric ISO pitch 1.5 mm or NPT ANSI ASME B1.20.1
Enclosure cover	detachable, optional hinges
Cover fixing	stainless steel socket cap head screws
Cover seal	none, O-ring for IP66/67
Degree of protection	IP66 (IP66/67 with O-ring) NEMA Type 4, 4X, 7, 9
Cable entry	see data table
Grounding	M6 external grounding points see data table
Mass	valid for empty enclosure, will increase according to integrated components
Material	
Enclosure	aluminum alloy or AISI 316L stainless steel
Finish	aluminum: epoxy coated RAL 7005 (grey) stainless steel: shot peened
O-Ring	silicone
Flamepath grease	Greasil MS4 or NEVER SEEZ Marine Grade
Glass	thermo-resistant tempered glass
Material of screws	stainless steel
Yield stress	min. 450 N/mm ² for ATEX / IECEx 100,000 PSI for North American approvals
Ambient conditions	
Ambient temperature	-60 ... 60 °C (-58 ... 140 °F) depending on integrated components
Data for application in connection with hazardous areas	
EU-type examination certificate	INERIS 14 ATEX 0022X INERIS 14 ATEX 9010U
Marking	Ex II 2 GD Ex db IIIB+H ₂ T [*] Gb Ex tb IIIC T ^{**} °C Db T6/T85 °C, T5/T100 °C, T4/T135 °C, T3/T200 °C depending on configuration, ambient temperature and built-in power loss
Maximum power dissipation	see data table maximum power dissipation at T4/+40 °C enclosure without window
International approvals	
UL approval	
Approved for	Class I, Division 1, Groups B, C, D Class II, Division 1, Groups E, F, G Type 4, 4X, 7, 9
cULus	Empty enclosure E482035, UL 50E, UL 1203, CSA C22.2, No. 25, 30
cETLus	Control panels E5003368
Ambient temperature	-25 ... 60 °C (-13 ... 140 °F)
IECEx approval	IECEx INE 14.0029X IECEx INE 14.0028U
EAC approval	RU C-DE.AK58.B.01787/21
CCC approval	2020322303002546
Further approvals	available on request

Conformity	
Degree of protection	EN60529 or UL 50 / UL 50E
CE marking	0080 or 0102, see type label
Standards	
EN IEC 60079-0:2018; EN 60079-1:2014; EN IEC 60079-7:2015/A1:2018; EN 60079-11:2012; EN 60079-28:2015; EN 60079-31:2014; and/or IEC 60079-0:2017; IEC 60079-1:2014; IEC 60079-7:2015; IEC 60079-11:2011; IEC 60079-28:2015; IEC 60079-31:2013;	

Dimensions EJB* Aluminum



Dimensions EJBX* Stainless Steel



Legend

Dimension values see data table.
Real values might differ slightly due to manufacturing tolerances.
Dimensions are valid for standard enclosures and IP66 variants only.
Image and drawing are generic for this device type and may deviate from the specific variant.

Legend

A	Height
B	Width
C	Depth
D	Internal height
E	Internal width
F	Internal depth to surface mounting plate
G	Mounting holes distance, vertical
H	Mounting holes distance, horizontal
J	Mounting holes diameter
K	Maximum external dimension of mounting brackets
[A] ... [D]	Cable entry faces

Class of Temperature / Ambient Temperature for Cable Entries and Cable

Only use cable entries and cables suitable for the class of temperature / ambient temperature as reported in the following table.

Max. ambient temperature [°C]	Class of temperature type of protection Ex d IIA, IIB, IIB+H ₂			
	T6 [°C]	T5 [°C]	T4 [°C]	T3 [°C]
40	-	90	120	140 (with window) 175 (without window)
50	-	90	120	140 (with window) 175 (without window)
55	-	90	120	140 (with window) 175 (without window)
60	-	90	120	140 (with window) 175 (without window)

Connection with cables suitable for the above mentioned temperatures.

Comparative Table Marking / Thread of the Cable Entry

Threaded entries in the enclosures are identified by the following coding:

Markings according to the requirements of IEC 60079-1 clause 13.2			
00 C = 1/4" ISO228	00 N = 1/4" NPT	00 M = M12x1.5	9PG = PG9
1 C = 1/2" ISO228	0 N = 3/8" NPT	0 M = M16x1.5	11PG = PG11
3 C = 1" ISO228	1 N = 1/2" NPT	1 M = M20x1.5	13PG = PG13
00 G = 1/4" ISO 7/1	2 N = 3/4" NPT	2 M = M25x1.5	16GP = PG16
0 G = 3/8" ISO 7/1	3 N = 1" NPT	3 M = M32x1.5	21PG = PG21
1 G = 1/2" ISO 7/1	4 N = 1 1/4" NPT	4 M = M40x1.5	29PG = PG29
2 G = 3/4" ISO 7/1	5 N = 1 1/2" NPT	42 M = M42x1.5	36PG = PG36
3 G = 1" ISO 7/1	6 N = 2" NPT	5 M = M50x1.5	42PG = PG42
4 G = 1 1/4" ISO 7/1	7 N = 2 1/2" NPT	6 M = M63x1.5	48PG = PG48
5 G = 1 1/2" ISO 7/1	8 N = 3" NPT	7 M = M75x1.5	
6 G = 2" ISO 7/1		8 M = M85x1.5	
7 G = 2 1/2" ISO 7/1			
8 G = 3" ISO 7/1			

"G" means also equivalent type according UNI6125 or EN10266-2

Example: diameter of the hole Ref. 2 M = thread M25 x 1.5

Variant-Specific Data and Cable Entries max. Quantity per Size: EJB* Aluminum - Approvals for ATEX / IECEx / North America

Type	External dimensions [mm]				Internal dimensions [mm]			Mounting [mm]			Mass approx. [kg]	Cover screws			North-American approval	Max. power dissipation at T4/+40 °C [W]	Faces A and B								Faces C and D								Cover					
	A	B	C	K	D	E	F	G	H	J		Mx	qty.	Torque [Nm]		ATEX / IECEx	North-America	M20	M25	M32	M42	M50	M63	M75	M85	M20	M25	M32	M42	M50	M63	M75	M85	M12	M20	M32		
																		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	1/4"	1/2"	1"		
EJB0*	200	136	150	128	140	75	115	133	108	8	3.8	M6	6	15	20	X	51	4	3	1	1	1	1	-	-	5	4	3	2	2	1	-	-	4	3	3		
EJB2A*	220	220	159	226	162	162	130	157	206	8	6.4	M6	8	15	-	-	104	8	8	5	3	2	1	-	-	8	8	5	3	2	1	-	-	9	9	5		
EJB4A*	265	225	180	226	200	160	136	188	206	8	8.5	M8	10	20	30	X	125	6	5	4	4	3	2	-	-	8	6	5	5	4	2	-	-	20	16	9		
EJB6A*	332	232	172	216	250	150	133	230	196	8	9.8	M8	10	20	-	-	139	6	6	4	2	2	1	-	-	12	10	8	3	3	2	-	-	12	12	10		
EJB8*	390	290	182	270	300	200	131	282	250	10	15.7	M8	14	20	-	-	192	9	8	6	3	2	2	1	-	14	12	10	4	4	3	2	-	20	20	14		
EJB8A*	390	290	204	270	300	200	153	282	250	10	16.6	M8	14	20	30	X	211	12	8	6	3	3	2	1	1	17	12	10	6	4	3	2	-	20	20	14		
EJB8B*	390	290	237	270	300	200	186	282	250	10	17.9	M8	14	20	30	X	236	14	12	9	6	4	3	2	1	22	20	14	8	7	5	3	2	20	20	14		
EJB9A*	412	242	186	226	330	160	139	312	206	8	14.2	M8	14	20	-	-	185	8	6	5	2	2	1	1	14	13	10	4	4	3	3	-	20	20	12			
EJB9B*	412	242	258	226	330	160	211	312	206	8	16.8	M8	14	20	-	-	238	12	9	8	4	4	2	1	1	26	19	15	8	8	5	3	2	20	20	12		
EJB10A*	468	358	215	350	370	260	165	345	320	9	25.1	M8	16	20	30	X	305	15	12	8	6	3	3	2	2	20	18	12	9	7	4	3	2	30	30	20		
EJB10B*	468	358	265	350	370	260	215	345	320	9	28.7	M8	16	20	30	X	353	18	15	12	6	5	4	2	2	25	23	18	10	8	7	3	3	30	30	20		
EJB11A*	498	418	225	415	400	320	173	363	385	10	32	M10	22	30	45	X	383	14	14	10	7	5	4	3	2	20	20	13	9	7	5	3	3	28	28	24		
EJB11B*	498	418	276	415	400	320	218	363	385	10	37	M10	22	30	45	X	432	18	18	14	8	8	5	3	2	21	21	17	10	10	7	4	3	28	28	24		
EJB15*	580	430	226	460	500	350	172	460	430	11	40.8	M10	20	30	-	-	481	17	17	10	8	7	4	3	2	23	23	14	10	10	5	4	3	40	40	30		
EJB15A*	580	430	282	460	500	350	221	460	430	11	52	M10	20	30	45	X	540	18	18	11	8	8	5	3	3	24	24	17	12	12	7	5	3	40	40	30		
EJB17*	676	503	269	494	570	397	198	538	464	11	56	M10	22	30	-	-	745	28	21	15	10	9	5	3	3	38	30	25	13	13	9	5	4	49	49	40		
EJB17A*	676	503	389	494	570	397	317	538	464	11	67	M10	22	30	-	-	746	32	28	25	15	13	8	6	5	50	45	38	20	18	14	8	5	49	49	40		
EJB17Q*	630	630	368	613	500	500	278	453	583	11	94	M12	24	40	55	X	593	49	35	26	17	15	10	7	5	49	35	26	17	15	10	7	5	53	53	45		
EJB18A*	750	537	303	535	640	427	213	509	505	11	100	M12	24	40	55	X	707	29	22	17	11	9	5	4	3	44	34	25	16	15	7	6	4	52	52	45		
EJB18B*	750	537	408	535	640	427	318	509	505	11	100	M12	24	40	55	X	864	45	35	26	17	15	12	6	5	57	50	43	28	21	17	8	8	52	52	45		
EJB20*	935	685	353	670	805	555	247	668	630	14	167	M16	32	65	-	-	1616	34	30	20	11	10	8	3	2	50	46	31	15	14	10	7	5	65	65	52		
EJB20A*	935	685	500	670	805	555	393	668	630	14	195	M16	32	65	-	-	1616	50	43	38	28	21	16	8	6	80	70	54	43	32	23	10	9	65	65	52		

Variant-Specific Data and Cable Entries max. Quantity per Size: EJBX* Stainless Steel - Approvals

Variant-Specific Data and Cable Entries max. Quantity per Size: EJBX* Stainless Steel - Approvals for ATEX / IECEx Asia Pacific

Type	External dimensions [mm]				Internal dimensions [mm]				Mounting [mm]		Mass approx. [kg]	Cover screws			Max. power dissipation at T4/+40 °C [W]	Faces A and B								Faces C and D								Cover				
	A	B	C	K	D	E	F	G	H	J		Mx	qty.	Torque [Nm]		M20	M25	M32	M42	M50	M63	M75	M85	M20	M25	M32	M42	M50	M63	M75	M85	M12	M20	M32		
																1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	1/4"	1/2"	1"		
EJBX0*.U*.AI*	198	133	156.5	140	140	75	110	133	120	9	12	M6	6	15	51	4	3	1	1	1	1	-	-	5	4	3	2	2	1	-	-	4	3	3		
EJBX2A*.U*.AI*	220	220	171.5	226	160	160	125	157	206	9	21	M6	8	15	104	8	8	5	3	2	1	-	-	8	8	5	3	2	1	-	-	9	9	5		
EJBX3A*.U*.AI*	252	152	171.5	165	200	100	135	185	145	8	18	M6	10	15	83	5	4	3	2	1	1	-	-	8	8	5	3	3	2	-	-	8	8	6		
EJBX4A*.U*.AI*	262	222	191.5	226	200	160	145	188	206	9	25	M8	10	25	125	6	5	4	4	3	2	-	-	8	6	5	5	4	2	-	-	20	16	9		
EJBX6A*.U*.AI*	309	209	181.5	216	250	150	135	233	196	9	28	M8	10	25	139	8	8	5	3	2	2	1	1	14	14	8	5	5	3	2	2	15	15	8		
EJBX8B*.U*.AI*	371	271	241.5	270	300	200	195	282	250	11	46	M8	14	25	236	12	12	9	8	6	3	2	1	17	15	14	11	8	5	3	2	20	20	12		
EJBX10B*.U*.AI*	450	340	271.5	350	370	260	225	345	320	11	67	M8	16	25	353	12	12	11	8	6	4	3	2	18	18	15	11	8	5	4	3	20	20	16		
EJBX11B*.U*.AI*	490	410	276.5	415	400	320	230	363	385	11	84	M10	22	50	432	18	18	14	8	8	5	3	2	21	21	17	10	10	7	4	3	28	28	24		
EJBX15A*.U*.AI*	580	430	266.5	460	500	350	220	462	430	13	101	M10	20	50	540	18	18	11	8	8	5	3	3	24	24	17	12	12	7	5	3	40	40	30		
EJBX17A*.U*.AI*	662	492	365.5	494	570	400	315	550	464	15	149	M10	22	50	746	24	24	18	12	11	8	6	5	32	32	21	18	17	14	8	5	35	35	24		
EJBX17Q*.U*.AI*	594	594	322.5	613	492	492	270	453	583	15	177	M12	24	65	593	30	22	18	17	14	8	7	5	30	22	18	17	14	8	7	5	42	42	28		
EJBX18B*.U*.AI*	734	524	372.5	535	632	422	320	590	505	15	207	M12	24	65	864	24	24	18	15	15	11	6	5	36	36	30	26	18	14	8	8	45	45	32		
EJBX20A*.U*.AI*	922	672	434.5	670	800	550	380	697	630	17	338	M12	32	65	1616	67	54	40	12	10	6	4	4	102	78	60	20	12	8	8	8	60	60	60		

Variant-Specific Data and Cable Entries max. Quantity per Size: EJBX* Stainless Steel - Approvals for North America

Type	External dimensions [mm]				Internal dimensions [mm]				Mounting [mm]		Mass approx. [kg]	Cover screws			Max. power dissipation at T4/+40 °C [W]	Faces A and B								Faces C and D								Cover				
	A	B	C	K	D	E	F	G	H	J		Mx	qty.	Torque [Nm]		M20	M25	M32	M42	M50	M63	M75	M85	M20	M25	M32	M42	M50	M63	M75	M85	M12	M20	M32		
																1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	1/2"	3/4"	1"		
EJBX0*.U*.UL*	198	133	156.5	140	140	75	110	133	120	9	12	M6	6	25	51	2	1	-	-	-	-	-	-	4	2	1	-	-	-	-	3	2	1			
EJBX2A*.U*.UL*	220	220	171.5	226	160	160	125	157	206	9	21	M6	8	25	104	8	8	5	3	2	1	-	-	8	8	5	3	2	1	-	-	9	9	5		
EJBX3A*.U*.UL*	252	152	171.5	165	200	100	135	185	145	8	18	M6	10	25	83	4	3	2	1	-	-	-	-	10	7	4	2	1	-	-						