

Accessories

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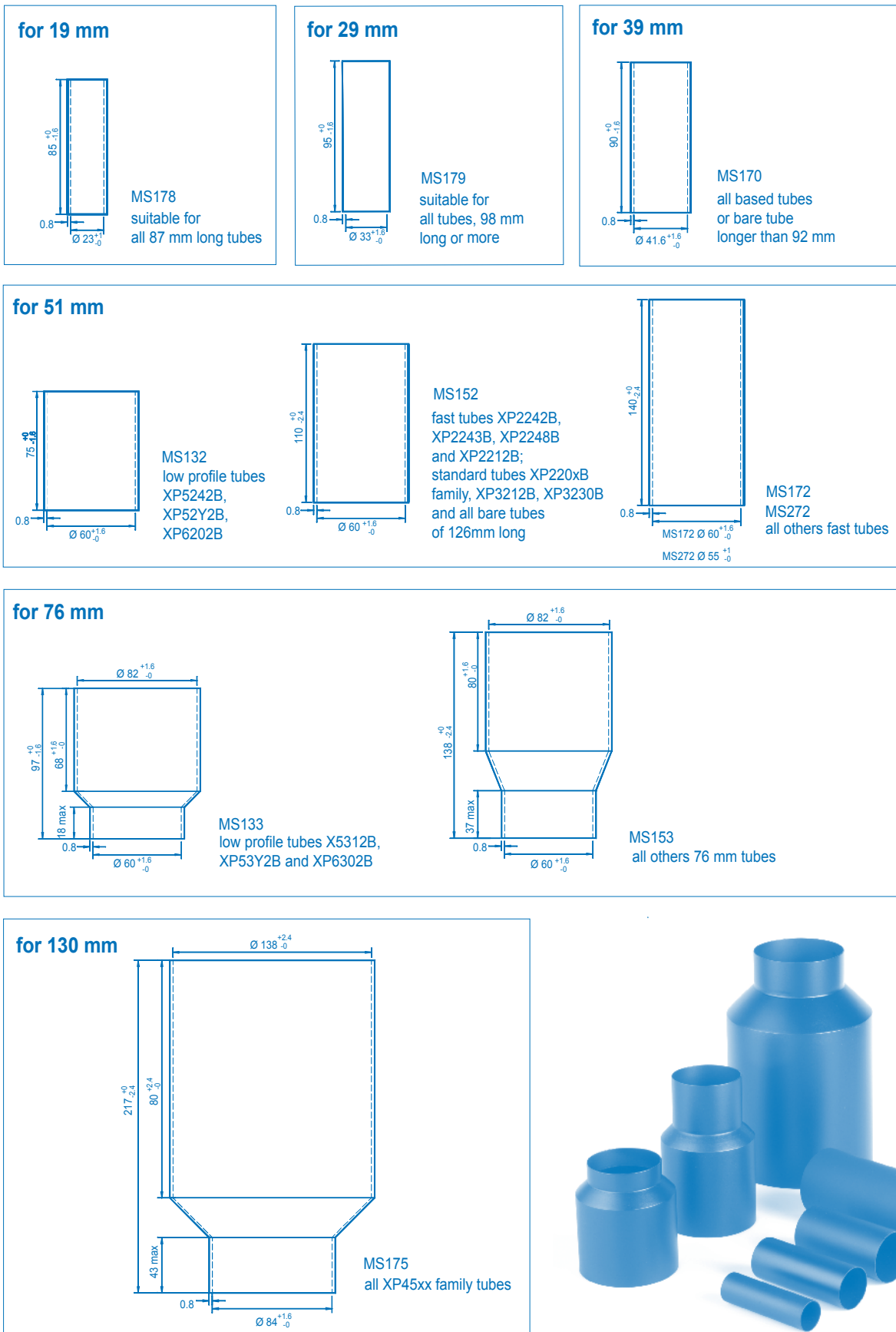


Mu-metal shields

PHOTONIS 'treated' mu-metal shields provide effective protection against magnetic fields up to 5 mT (depending on the tube type), and exhibit virtually no remanence after exposure to strong fields. All shields surfaces are painted mat black.

Take due care when handling mu-metal shields, strong mechanical shocks or deformations can degrade their magnetic properties.

PHOTONIS also designs customised magnetic shields. Please, contact your local PHOTONIS sales organization if you are interested in a special device.



dimensions in mm

Voltage dividers

A complete range of voltage dividers is available for PHOTONIS PMTs:

- **customised voltage dividers assemblies, supplied attached to the tubes and well adapted to large quantities.**
- **accessories for fast tubes (S563 family) including voltage divider and mu-metal shield**
- **compact voltage dividers (VDxxx, see next page).**

Though those dividers fulfill most user’s requirements, PHOTONIS also designs customised products. Please contact your local PHOTONIS representative.

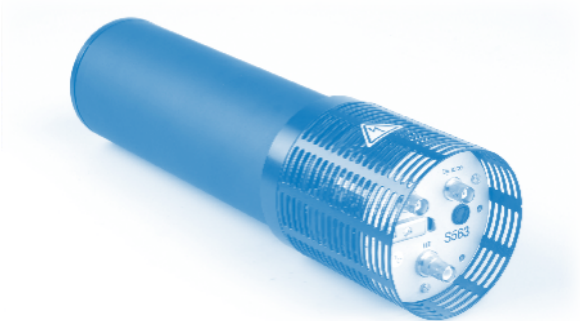
Customized assemblies

PHOTONIS designs voltage divider assemblies, an extremely cost effective way of meeting your mechanical and electrical requirements. Supplied attached to the tube and ready for use, these assemblies contain a voltage divider and additional electronic circuitry such as protection resistors and decoupling components. They provide the optimum interface between PMT and your signal-processing circuitry, ensuring the highest signal quality in your application (the first stage of your anode signal amplification chain can be included).



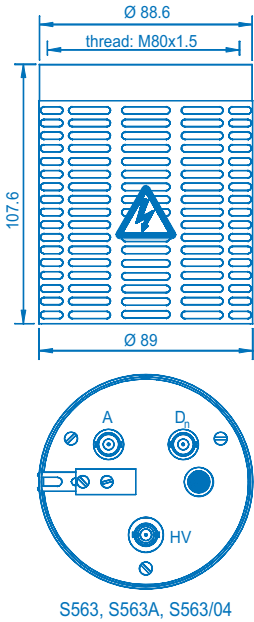
Voltage divider and shield assemblies for very fast tubes

Special assemblies including a voltage divider and an optional mu-metal shield are available for 2” fast PMTs used to detect very brief low-intensity light pulses in physics experiments using coincidence measurements, Cherenkov light studies, high-speed scintillators, and in single photoelectron counting.

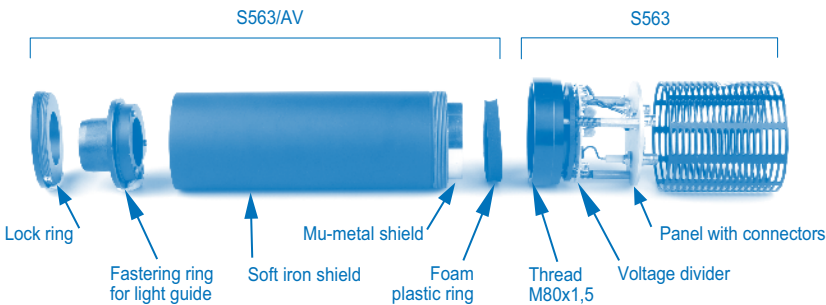


	Voltage divider	+ Front shield	= Voltage divider & Front shield assembly
Fast tubes	S563	+ S5632/AV	= S5632
Ultra fast tubes	S563/04	+ S5632/04	= S5632/04
Length (mm)	108	240	334
Diameter (mm)	90	80	90
Mass (g)	490	4000	4490

See voltage dividers characteristics in the table next page.



S563, S563A, S563/04



Voltage dividers

<i>voltage divider</i>	<i>divider type ¹⁾</i>	<i>total resistance (MΩ)</i>	<i>I_a linearity limit ²⁾ (μA)</i>	<i>max. supply voltage (V)</i>	<i>dissipation ³⁾ (W)</i>	<i>tube diameter (mm)</i>	<i>number of stages</i>	<i>main PMT types</i>	<i>supply ⁴⁾</i>	<i>output signal</i>
STANDARD TUBES										
for 19 mm tubes										
VD108	B	5.9	13	1 800	0.5	19	8	XP1981	-HV	DC/pulse
VD108/A	A	4.2	18	1 800	0.8	19	10	XP1901, XP1910, XP1911, XP1911/UV, XP1912, XP1918	-HV	DC/pulse
VD308	A	4.2	18	1 800	0.8	19	8	XP1981	+HV	pulse
VD308/B	B	5.6	14	1 800	0.6	19	10	XP1901, XP1910, XP1911, XP1911/UV, XP1912, XP1918	+HV	pulse
VD1A8	A	4	10	1 700	0.7	19	10	XP2802, XP2803, XP2812, XP2822, XP2832	-HV	DC/pulse
for 25 mm tubes										
VD101T/A	A	3.8	50	1 800	0.9	25	10	XP3100, XP3102, XP3108, XP3132	-HV	DC/pulse
VD1A1T/A	A	3.9	50	1 600	0.7	25	10	XP3112, XP31S2, XP31T2	-HV	DC/pulse
for 29 mm tubes										
VD109	B	5.9	13	1 800	0.6	29	10	XP2900, XP2901, XP2971, XP2972, XP2978	-HV	DC/pulse
VD109/T ⁶⁾	A	2.5	300	1 500	0.9	29	10	XP2900, XP2901, XP2971, XP2972, XP2978	-HV	DC/pulse
VD119	B	7.1	10	1 800	0.5	29	11	XP2910, XP2982	-HV	DC/pulse
VD189	B	5.5	13	1 800	0.6	29	8	XP2960, XP2961, XP2962, XP2963	-HV	DC/pulse
VD1A9	A	3.9	10	1 600	0.7	29	11	XP2920, XP2930, XP2940, XP2950	-HV	DC/pulse
VD1B9	A	3	25	1 800	1.1	29	10	XP2970	-HV	DC/pulse
for 39 mm tubes										
VD200K	A	3.6	21	1 800	0.9	39	10	XP2012B, XP2013B, XP2015B, XP2017B, XP2018B, XP2042B, XP2052B, XP2070B, XP2072B, XP2081B, XP2090B	-HV (or +HV)	DC/pulse (pulse)
VD200K/B	B	5.5	13	1 800	0.6	39	10	XP2012B, XP2013B, XP2015B, XP2017B, XP2018B, XP2042B, XP2052B, XP2070B, XP2072B, XP2081B, XP2090B	-HV (or +HV)	DC/pulse (pulse)
for 51, 60, 76, 90 and 130 mm tubes										
VD202K	A	3.6	21	1 800	0.9	51	10	XP2201B, XP2202B, XP2203B, XP3230B, XP6202B	-HV	DC/pulse
						76	10	XP3330B, XP6302B	(or +HV)	(pulse)
VD202K/01	A	4.2	15	1 500	0.6	51	10	XP5212B, XP5242B, XP5292B	-HV (or +HV)	DC/pulse (pulse)
						60	9	XP5612B		
						76	10	XP5312B		
						90	10	XP3730B		
VD282K	A	3.3	20	1 500	0.7	130	10	XP3530B, XP3540B, XP3550B	-HV (or +HV)	DC/pulse (pulse)
						51	8	XP3212B, XP3292B		
						60	8	XP3612B, XP3672B, XP3692B		
VD282K/01	A	3.9	17	1 500	0.6	76	8	XP3312B, XP3372B, XP3392B, XP3672B	-HV (or +HV)	DC/pulse (pulse)
						90	8	XP3712B		
						76	8	XP3392B		
						90	8	XP3712B	(or +HV)	(pulse)
FAST & VERY FAST TUBES										
for S563										
S563	C	1.8	56	3 000	5.0	51	12	XP2020, XP2020Q, XP2233B, XP2237B, XP2254B, XP2262B, XP2272B, XP2268B	-HV	DC/pulse
S563/04	C	1.9	53	3 000	4.7	51	12	XP2020/UR, XP2020/URQ	-HV	DC/pulse
for 51 mm fast tubes										
VD122K ⁵⁾	B	2.2	53	2 500	2.8	51	12	XP2233B, XP2237B, XP2262B, XP2268B, XP2272B	-HV	DC/pulse
VD162K/B	B	1.5	70	2 200	3.2	51	6	XP2242B, XP2243B, XP2248B	-HV	DC/pulse
VD182K/C ⁶⁾	C	1.9	300	2 500	3.4	51	8	XP2282B	-HV	DC/pulse
for 51 mm very fast tubes										
VD124K ⁵⁾	C	2.2	58	3 000	4.0	51	12	XP2020, XP2020Q, XP2254B	-HV	DC/pulse
VD124K/T ⁶⁾	C	2.2	400	3 000	4.0	51	12	XP2020, XP2020Q, XP2254B	-HV	DC/pulse
VD127K/T ⁶⁾	C	2.8	400	3 000	3.2	51	12	XP2020/UR, XP2020/URQ	-HV	DC/pulse
for 76 mm fast tubes										
VD123K ^{5) 6)}	C	3	300	3 000	3.1	76	12	XP4312B, XP4318B, XP4372B, XP4392B	-HV	DC/pulse
VD183K	C	4	23	2 000	1.0	76	8	XP3461B, XP3462B, XP3468B	-HV	DC/pulse
for 130 mm fast tubes										
VD105K ⁵⁾	C	2.8	40	2 700	2.6	130	10	XP4500B, XP4508B, XP4512B, XP4572B	-HV	DC/pulse
VD105K/01 ^{5) 6)}	C	2.8	250	2 700	2.7	130	10	XP4500B, XP4508B, XP4512B, XP4572B	-HV	DC/pulse
VD105K/02 ⁵⁾	C	2.6	40	2 300	2.1	130	8	XP4592B	-HV	DC/pulse
VD305K/B ⁵⁾	C	2.8	40	2 700	2.6	130	10	XP4500B, XP4508B, XP4512B, XP4572B	+HV	pulse

Voltage dividers dimensions (in mm)



Notes

1) **A:** iterative voltage divider which maximizes gain;

B: progressive voltage divider which optimizes linearity and in most cases the timing characteristics;

C: progressive voltage divider for certain fast tubes which provides a good compromise between A-type and B-type dividers for gain, linearity and timing characteristics.

2) The mentioned current is the anode current above which the linearity of the PMT is affected by more than 4%, due to the limitation of the divider circuitry; the PMT has however its own linearity, which is not included in this number; see Linearity (p.2 - 14) and Voltage Dividers (p.2 - 19) for more details.

3) at max. supply voltage.

4) **-HV:** cathode at -HV; anode grounded;

+HV: anode at +HV, cathode grounded.

The VD200K, VD202K, and VD282K families are suitable for both +HV and -HV. They are supplied set for -HV operation. For +HV operation, remove the cap and modify the internal connections according to the instructions supplied with the base.

5) possible voltage adjustments with internal trimmer:

VD105K: G1 and G2 voltages;

VD105K/01: G1 voltage;

VD105K/02: G1 voltage;

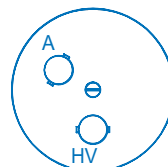
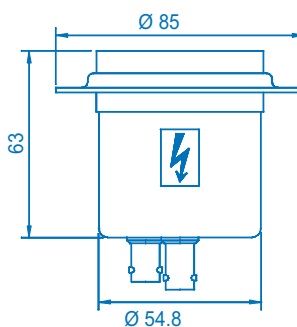
VD122K: D2 voltage;

VD123K: G voltage;

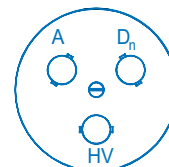
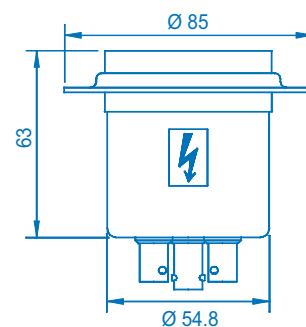
VD124K: G1 and D2 voltages;

VD305K/B: G1 and G2 voltages;

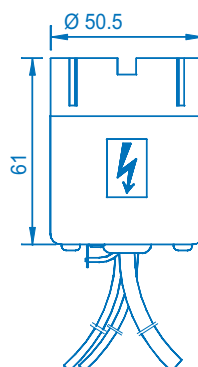
6) The last 3 stages are transistorized, stabilizing the dynode voltages to within 1 V at up to 100 μ A and above.



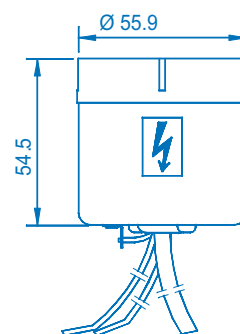
VD105K, VD105K/02,
VD122K, VD162K, VD182K,
VD183K, VD305K.



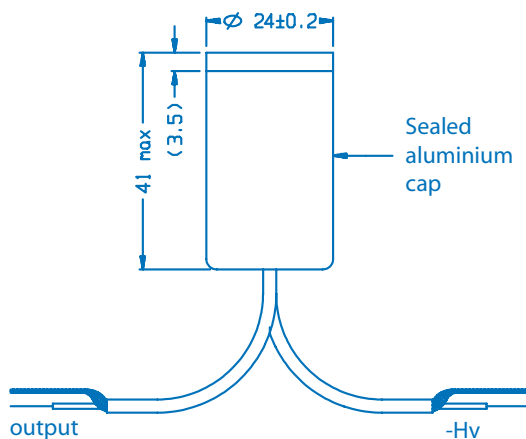
VD105K/01,
VD123K, VD124K, VD124K/T,
VD127K/T, VD127K



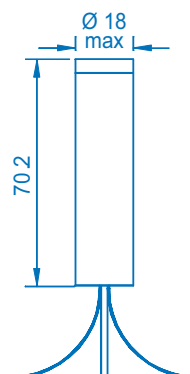
VD200K



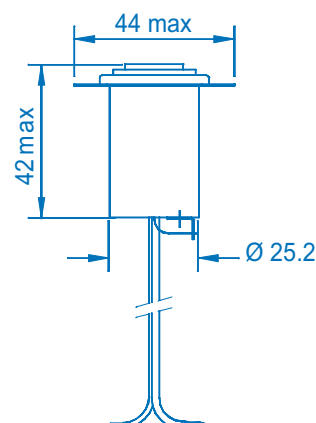
VD202K, VD202K/01,
VD282K, VD282K/01



VD101T/A
VD1A1T/A

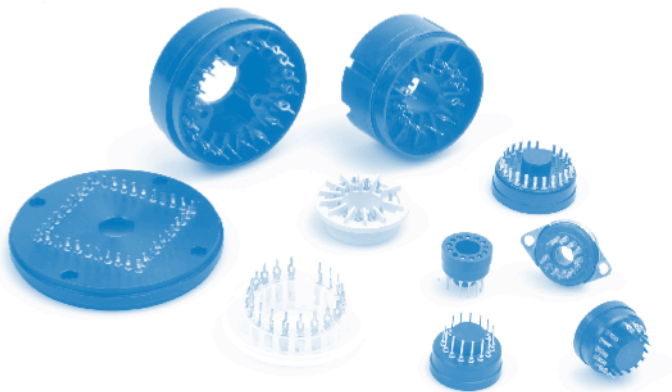


VD108, VD1A8,
VD308



VD109, VD109/T, VD119,
VD189, VD1A9,
VD1B9 (no flange)

Sockets

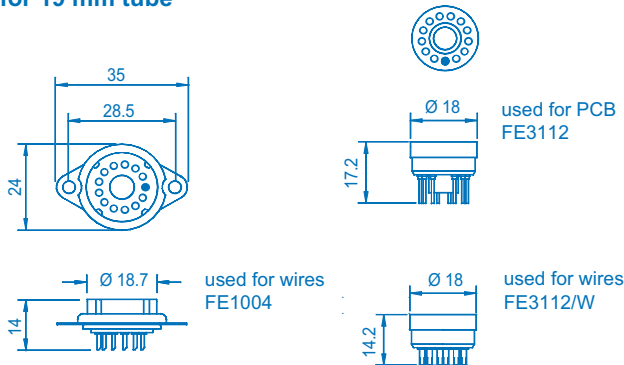


Care has been taken in the design and manufacture of these sockets. High-grade insulating and contact materials ensure optimal results over a long operating life.

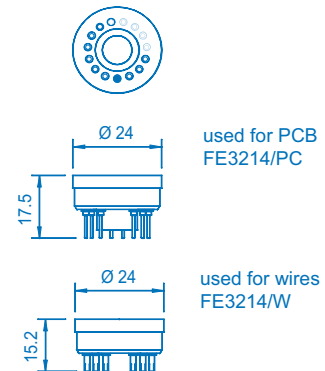
The data given in Part 4 of this catalogue are only guaranteed when the tubes are used with the original PHOTONIS sockets.

A PHOTONIS PMT and a PHOTONIS socket - the perfect match.

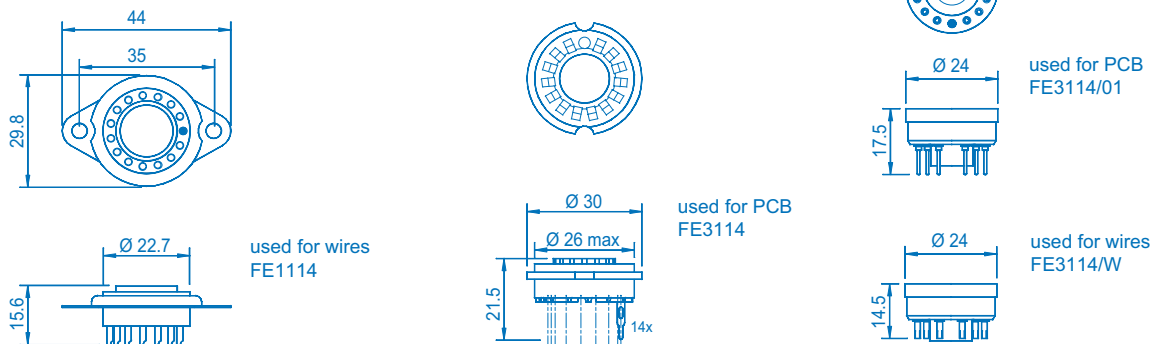
for 19 mm tube



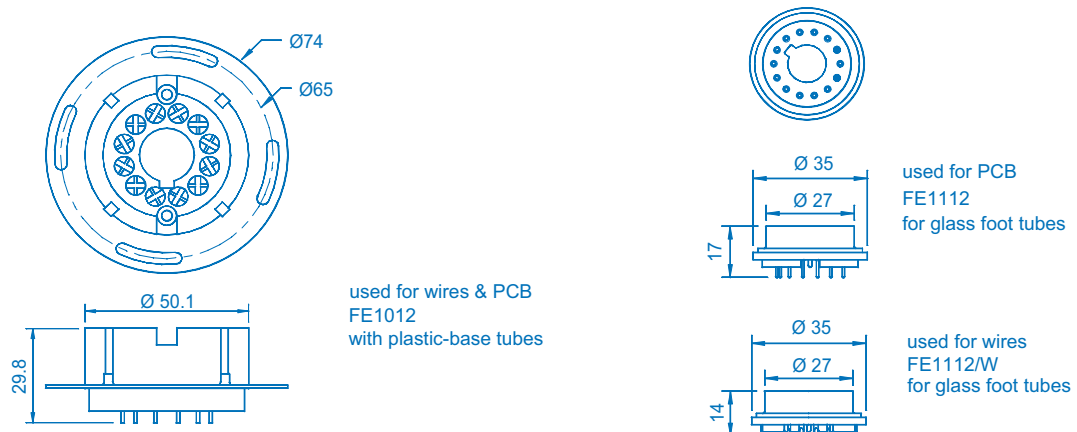
for 25 mm tubes



for 29 mm tubes

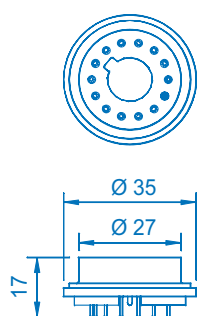


for 39 mm tubes

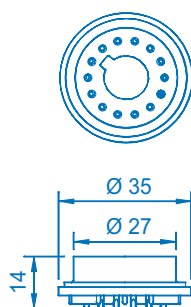


nominal dimensions in mm

for XP3062

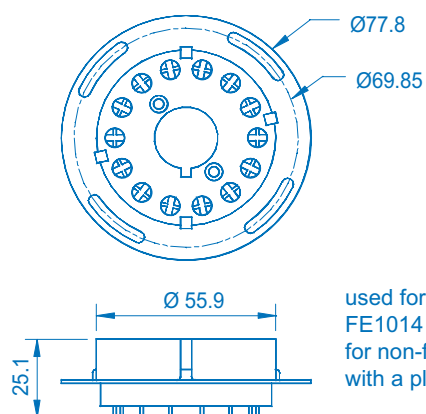


used for PCB
FE1113
for XP3062

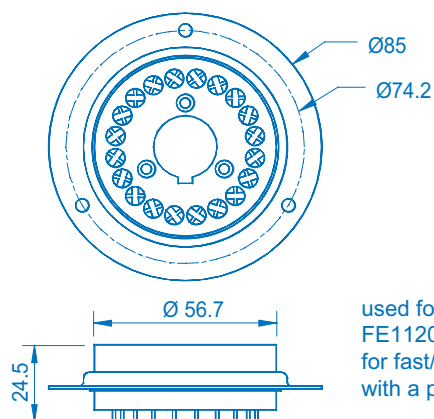


used for wires
FE1113/W
for XP3062

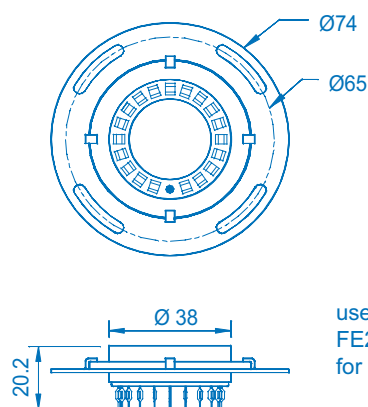
for 51 mm tubes and bigger



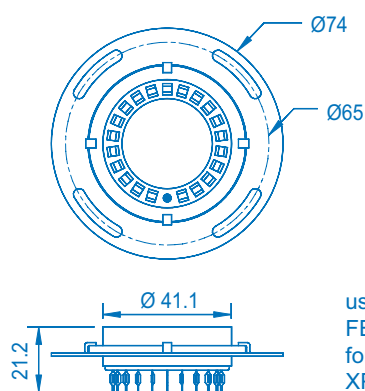
used for wires & PCB
FE1014
for non-fast tubes
with a plastic base



used for wires & PCB
FE1120
for fast/very fast tubes
with a plastic base

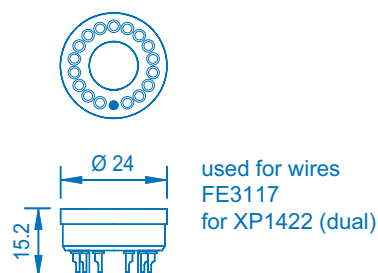


used for wires & PCB
FE2019
for glass-foot tubes

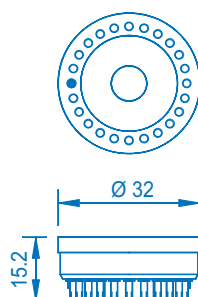


used for wires & PCB
FE2021
for XP1802, XP2220,
XP2228 and XP22K0

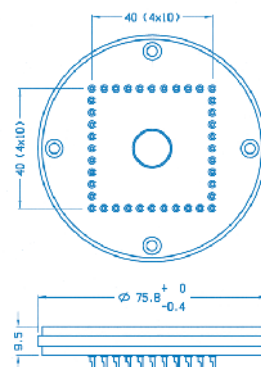
for multipixel tubes



used for wires
FE3117
for XP1422 (dual)



used for wires
FE3123
for XP1452



used for wires
FE3139
for XP1472

nominal dimensions in mm