

Energy efficiency

Front-panel analogue instruments



Front panel analogue instruments

Technical features		
Rated max. reference voltage for insulation	[V]	650
Test voltage	[V]	2000 eff. (50 Hz/1 min)
Precision class		1.5 (0.5 for frequency meters)
Overload capacity ①		
- ammetric windings		up to $I_n \times 10$ / < 5 sec. up to $I_n \times 2$ /permanent
- voltmetric windings		up to $U_n \times 2$ / < 5 sec. up to $U_n \times 1.2$ /permanent
Operating temperature	[°C]	-20...+40
Storage temperature	[°C]	-40...+70
Average and max. relative humidity (DIN 40040) ②		65% (yearly average)
		85% (+35 °C/60 days a year)
Vibration resistance (IEC 50-1)	[g (9.81 m/s)]	0.08-1.8 (0.35 mm/10-55 Hz; 3 axis/6 h)
Degree of protection		IP52 indoors
		IP00 on the terminals (IEC 144. DIN 40050)
		IP40 with suitable terminal covers
Materials		
- cases and front edge		self-extinguishing thermosetting material in accordance with UL94 V-0, fungus and termite resistant
- pointers (DIN 43802) ③		molded aluminium
- terminals		brass
Assembly		vertical/horizontal with special screw-on brackets d
Dimensions W x H x D (DIN 43700/43718)	[mm]	48 x 48 X 53 72 x 72 x 53 96 x 96 X 53
Applicable standards		IEC EN 61010-1

① The overload can be greater for instruments enabled by a CT because the transformer generally keeps secondary current peaks to within 10 I_n .

② Tropicalization enables the instruments to withstand up to 95% max. relative humidity (+35 °C/60 days). In accordance with DIN standard 40040, they must be protected against any penetration of humidity inside the device. Terminals, screws, washers, bolts and magnets are galvanically protected against rust, while the electrical circuits are painted with the special Multicolor PC52 varnish.

③ The pointer damping time is 1 second. The recorded values are cleared by pressing the control provided.

d With 0.5 mm - 19 mm thick panels, the screws must be attached in the fixing position nearest to the front edge of the measuring device, whereas the 20 mm - 39 mm thick panels require the screws to be fixed in the position furthest away from the front edge.

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VLM-1 48

Available in both alternating current and direct current versions, the front-panel mono-function measurement devices come in three standard sizes, 48 mm x 48 mm, 72 mm x 72 mm and 96 mm x 96 mm (special versions available on request), employable in single-phase networks. The range is composed of voltmeters and ammeters for a.c. and d.c. applications, and frequency meters for a.c. applications. Ammeters without scale for indirect connection must be completed with the appropriate scale, chosen according to the full-scale value.

Front-panel analogue voltmeters for alternating current

Size	Insertion	Scale	VT type	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		V a.c.		EAN	Type code	Order code		kg	pc.
48	D	50		541707	VLM-1-50/48	2CSG111100R4001			1
48	D	60		541806	VLM-1-60/48	2CSG111110R4001			1
48	D	80		541905	VLM-1-80/48	2CSG111120R4001			1
48	D	100		542001	VLM-1-100/48	2CSG111130R4001			1
48	D	150		542100	VLM-1-150/48	2CSG111150R4001			1
48	D	200		542209	VLM-1-200/48	2CSG111160R4001			1
48	D	250		542308	VLM-1-250/48	2CSG111180R4001			1
48	D	300		542407	VLM-1-300/48	2CSG111190R4001			1
48	D	400		542506	VLM-1-400/48	2CSG111210R4001			1
48	D	500		542605	VLM-1-500/48	2CSG111220R4001			1
48	D	600		542704	VLM-1-600/48	2CSG111230R4001			1
48	I	200	110/100	743705	VLM1-TV-110-100/200/48	2CSG121140R4001			1
48	I	300	230/100	542803	VLM1-TV-230-100/300/48	2CSG121170R4001			1
48	I	500	380/100	542902	VLM1-TV-380-100/500/48	2CSG121200R4001			1
48	I	500	400/100	743804	VLM1-TV-400-100/500/48	2CSG121210R4001			1
48	I	600	500/100	543008	VLM1-TV-500-100/600/48	2CSG121220R4001			1
48	I	800	600/100	743903	VLM1-TV-600-100/800/48	2CSG121230R4001			1
48	I	1100	1000/100	744009	VLM1-TV-1000-100/1100/48	2CSG121240R4001			1

Size	Insertion	Scale	VT type	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		V a.c.		EAN	Type code	Order code		kg	pc.
72	D	50		544104	VLM-1-50/72	2CSG112100R4001			1
72	D	60		544203	VLM-1-60/72	2CSG112110R4001			1
72	D	80		544302	VLM-1-80/72	2CSG112120R4001			1
72	D	100		544401	VLM-1-100/72	2CSG112130R4001			1
72	D	150		544500	VLM-1-150/72	2CSG112150R4001			1
72	D	200		544609	VLM-1-200/72	2CSG112160R4001			1
72	D	250		544708	VLM-1-250/72	2CSG112180R4001			1
72	D	300		544807	VLM-1-300/72	2CSG112190R4001			1
72	D	400		544906	VLM-1-400/72	2CSG112210R4001			1
72	D	500		545002	VLM-1-500/72	2CSG112220R4001			1
72	D	600		545101	VLM-1-600/72	2CSG112230R4001			1
72	I	200	110/100	744108	VLM1-TV-110-100/200/72	2CSG122140R4001			1
72	I	300	230/100	545200	VLM1-TV-230-100/300/72	2CSG122170R4001			1
72	I	500	380/100	545309	VLM1-TV-380-100/500/72	2CSG122200R4001			1
72	I	500	400/100	744207	VLM1-TV-400-100/500/72	2CSG122210R4001			1
72	I	600	500/100	545408	VLM1-TV-500-100/600/72	2CSG122220R4001			1
72	I	800	600/100	744306	VLM1-TV-600-100/800/72	2CSG122230R4001			1
72	I	1100	1000/100	744405	VLM1-TV-1000-100/1100/72	2CSG122240R4001			1

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D: direct connection
I: indirect connection with VT, CT and shunt, according to the type



VLM-1 96



VLM-2 48

Size	Insertion	Scale	VT type	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		V a.c.		EAN	Type code	Order code		kg	pc.
96	D	50		546702	VLM-1-50/96	2CSG113100R4001			1
96	D	60		546801	VLM-1-60/96	2CSG113110R4001			1
96	D	80		546900	VLM-1-80/96	2CSG113120R4001			1
96	D	100		547006	VLM-1-100/96	2CSG113130R4001			1
96	D	150		547105	VLM-1-150/96	2CSG113150R4001			1
96	D	200		547204	VLM-1-200/96	2CSG113160R4001			1
96	D	250		547303	VLM-1-250/96	2CSG113180R4001			1
96	D	300		547402	VLM-1-300/96	2CSG113190R4001			1
96	D	400		547501	VLM-1-400/96	2CSG113210R4001			1
96	D	500		547600	VLM-1-500/96	2CSG113220R4001			1
96	D	600		547709	VLM-1-600/96	2CSG113230R4001			1
96	I	200	110/100	744504	VLM1-TV-110-100/200/96	2CSG123140R4001			1
96	I	300	230/100	547808	VLM1-TV-230-100/300/96	2CSG123170R4001			1
96	I	500	380/100	547907	VLM1-TV-380-100/500/96	2CSG123200R4001			1
96	I	500	400/100	744603	VLM1-TV-400-100/500/96	2CSG123210R4001			1
96	I	600	500/100	548003	VLM1-TV-500-100/600/96	2CSG123220R4001			1
96	I	800	600/100	744702	VLM1-TV-600-100/800/96	2CSG123230R4001			1
96	I	1100	1000/100	744801	VLM1-TV-1000-100/1100/96	2CSG123240R4001			1

Front-panel analogue voltmeters for direct current

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Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		V a.c.	EAN	Type code	Order code		kg	pc.
48	D	10	549307	VLM-2-10/48	2CSG211040R4001			1
48	D	15	549406	VLM-2-15/48	2CSG211050R4001			1
48	D	25	549505	VLM-2-25/48	2CSG211070R4001			1
48	D	40	549604	VLM-2-40/48	2CSG211090R4001			1
48	D	60	549703	VLM-2-60/48	2CSG211110R4001			1
48	D	80	549802	VLM-2-80/48	2CSG211120R4001			1
48	D	100	549901	VLM-2-100/48	2CSG211130R4001			1
48	D	150	550006	VLM-2-150/48	2CSG211150R4001			1
48	D	200	550105	VLM-2-200/48	2CSG211160R4001			1
48	D	250	550204	VLM-2-250/48	2CSG211180R4001			1
48	D	400	550303	VLM-2-400/48	2CSG211210R4001			1
48	D	600	550402	VLM-2-600/48	2CSG211230R4001			1

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VLM-2 96

2CSC44509F001

Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		V a.c.	EAN	Type code	Order code		kg	pc.
72	D	10	551003	VLM-2-10/72	2CSG212040R4001			1
72	D	15	551102	VLM-2-15/72	2CSG212050R4001			1
72	D	25	551201	VLM-2-25/72	2CSG212070R4001			1
72	D	40	551300	VLM-2-40/72	2CSG212090R4001			1
72	D	60	551409	VLM-2-60/72	2CSG212110R4001			1
72	D	80	551508	VLM-2-80/72	2CSG212120R4001			1
72	D	100	551607	VLM-2-100/72	2CSG212130R4001			1
72	D	150	551706	VLM-2-150/72	2CSG212150R4001			1
72	D	200	551805	VLM-2-200/72	2CSG212160R4001			1
72	D	250	551904	VLM-2-250/72	2CSG212180R4001			1
72	D	400	552000	VLM-2-400/72	2CSG212210R4001			1
72	D	600	552109	VLM-2-600/72	2CSG212230R4001			1

Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		V a.c.	EAN	Type code	Order code		kg	pc.
96	D	10	552703	VLM-2-10/96	2CSG213040R4001			1
96	D	15	552802	VLM-2-15/96	2CSG213050R4001			1
96	D	25	552901	VLM-2-25/96	2CSG213070R4001			1
96	D	40	553007	VLM-2-40/96	2CSG213090R4001			1
96	D	60	553106	VLM-2-60/96	2CSG213110R4001			1
96	D	80	553205	VLM-2-80/96	2CSG213120R4001			1
96	D	100	553304	VLM-2-100/96	2CSG213130R4001			1
96	D	150	553403	VLM-2-150/96	2CSG213150R4001			1
96	D	200	553502	VLM-2-200/96	2CSG213160R4001			1
96	D	250	553601	VLM-2-250/96	2CSG213180R4001			1
96	D	400	553700	VLM-2-400/96	2CSG213210R4001			1
96	D	600	553809	VLM-2-600/96	2CSG213230R4001			1

D: direct connection

I: indirect connection with VT, CT and shunt, according to the type

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AMT1-A1 48

2CSC44509F001

Front-panel analogue ammeters for alternating current

Size	Insertion	Scale	Bbn 8012542	Order details		Price 1 piece	Weight 1 piece	Pack unit
mm		V a.c.	EAN	Type code	Order code		kg	pc.
48	D	1	543107	AMT1-A1-1/48	2CSG311020R4001			1
48	D	5	543206	AMT1-A1-5/48	2CSG311030R4001			1
48	D	10	543305	AMT1-A1-10/48	2CSG311040R4001			1
48	D	15	543404	AMT1-A1-15/48	2CSG311050R4001			1
48	D	20	543503	AMT1-A1-20/48	2CSG311060R4001			1
48	D	25	543602	AMT1-A1-25/48	2CSG311070R4001			1
48	D	30	543701	AMT1-A1-30/48	2CSG311080R4001			1
48	D	40	543800	AMT1-A1-40/48	2CSG311090R4001			1
48	I	SCL-A1	543909	AMT1-A1/48	2CSG321250R4001			1
48	I	SCL-A5	544005	AMT1-A5/48	2CSG321260R4001			1

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