



CHAPTER 10: KP/EP/MP MODULES FOR INSTRUMENT RACKS

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304	ICOM Didactic Supply	337	Electrical Appliance Tester

SELECT THE PERFECT CONFIGURATION FOR YOUR INDIVIDUAL TASKS

The modules of the KP -, EP - and MP System are characterized by following technical features:

- 3mm aluminium front panel with durable powder coating and abrasion proofed silkscreen printing
- each module is equipped with in- and output coupler for upgrading your workstation later on

- height: KP = 90mm
EP = 132mm (3HU)
MP = 221mm (5HU)
- width: KP = 40mm
EP = 264mm (52TE)
MP = 132mm (26TE)



KP **BLANK PANEL**

- For closing open spaces in KP channels.
- Aluminium front panel with fixing screws.

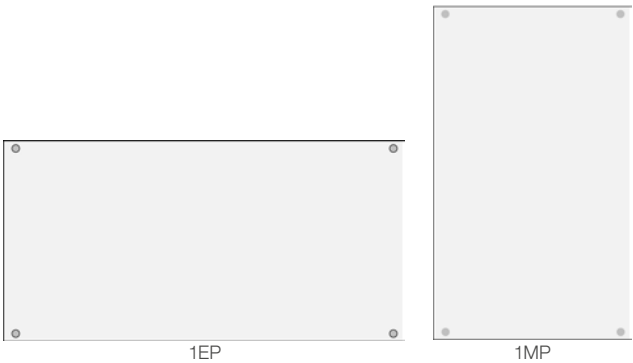
KP Blank Panel 321.0 BB .002					
BB Width					
01	40mm	07	280mm	13	520mm
02	80mm	08	320mm	14	560mm
03	120mm	09	360mm	15	600mm
04	160mm	10	400mm	16	640mm
05	200mm	11	440mm	17	680mm
06	240mm	12	480mm		



EP/ MP **BLANK PANEL**

- For closing open spaces in EP / MP channels.
- Aluminium front panel with fixing screws.

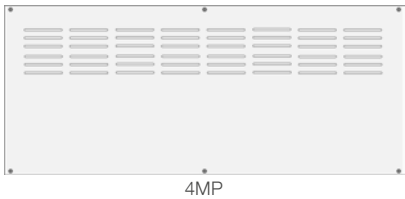
Blank Panel 33 S . BB 0.102					
S System		BB Width			
3	EP	05	0,25 EP	30	1,5 EP 1,5 MP
6	MP	10	0,5 EP 0,5 MP	40	2 EP 2 MP
		15	0,75 EP	60	3 EP 3 MP
		20	1 EP 1 MP	80	4 EP 4 MP
		25	1,25 EP		



EP/ MP **BLANK PANELS WITH VENTILATION SLOTS**

- For closing open spaces in EP / MP channels.
- Aluminium front panel with fixing screws.

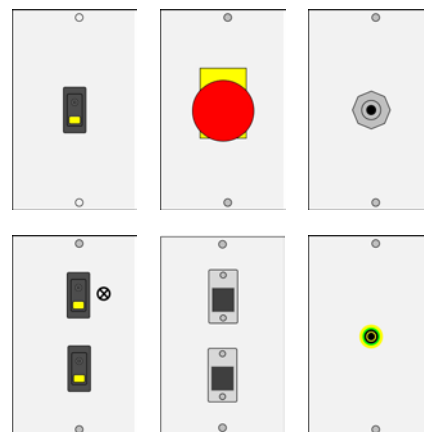
Blank Panel 33 S . BB 0.202					
S System		BB Width			
3	EP	10	0,5 EP	40	2 EP 2 MP
6	MP	20	1 EP 1 MP	60	3 EP 3 MP
		30	1,5 EP 1,5 MP	80	4 EP 4 MP



EP/ MP COMPENSATING PANEL WITH EQUIPMENT

- The EP / MP racks have left and / or right sided a compensating panel which can be equipped with listed modules.

Compensating Panel with Equipment	
333.800.100	1x Illuminated Switch, 2poles
333.800.150	2x Illuminated Switch, 2poles
333.800.200	1x Emergency Off Button, unwired
333.800.250	1x Emergency Off Button with Key, unwired
333.800.310	1x Keystone Adapter
333.800.320	2x Keystone Adapter
333.800.400	1x Quick Connector Pressured Air NW 7,2
333.800.500	1x 4mm PE Jack

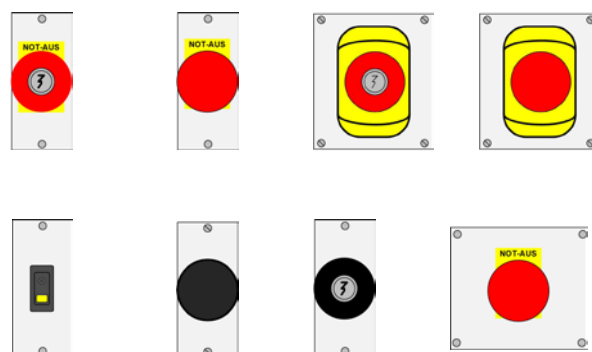


KP PANEL WITH EMERGENCY OFF OR SWITCH

- Emergency off button with two opener contacts, unwired.

Emergency Off Button or Switch 322.100. N E	
N Type	E Installation
0 Emergency Off with Key	0 horizontal (1KP)
1 Emergency Off	5 vertical (2KP)
2 Emergency Off with Collar and Key	(only Emergency Stop)
3 Emergency Off with Collar	
5 Illuminated Switch, 2poles	
6 Black Emergency Stop	
7 Black Emergency Stop with Key	

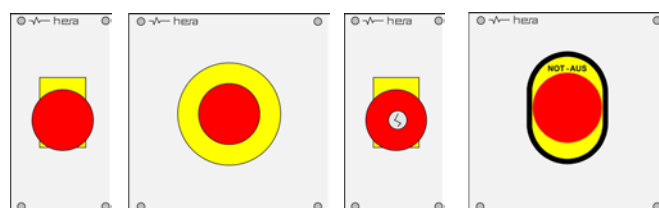
332.001.000	Extra NC Contact for Emergency Off (unwired)
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EP / MP PANEL WITH EMERGENCY OFF

- Emergency off button with two opener contacts, unwired.

EP Panel with Emergency Off Button	
332.056.102	Emergency Off (0,25EP)
332.106.102	Emergency Off (0,5EP)
332.066.102	Emergency Off with Key (0,25EP)
332.057.102	Black Emergency Stop (0,25EP)
332.067.102	Black Emergency Stop with Key (0,25EP)
332.156.102	Emergency Off with Collar (0,5EP)
332.166.102	Emergency Off with Collar and Key (0,5EP)



MP Panel with Emergency Off Button	
335.056.102	Emergency Off (0,5MP)
335.066.102	Emergency Off with Key (0,5MP)
335.057.102	Black Emergency Stop (0,5MP)
335.067.102	Black Emergency Stop with Key (0,5MP)
335.106.102	Emergency Off with Collar (0,5MP)
335.156.102	Emergency Off with Collar and Key (0,5MP)

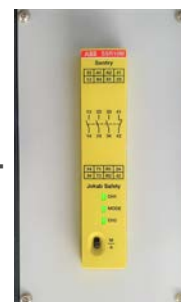


ALLWAYS ON THE SAFE SIDE

WITH VARIOUS SAFETY CATEGORIES

Following **safety features** for workstations are in our standard range:

- **Over Current - / Short Circuit Protection:** motor circuit breaker of quality brand, also serving for central on/ off.
- **Human Protection:** RCD 30mA type A or type B (recommended for experimental labs where residual currents with smooth DC portion might occur).
- **Emergency Off Function Category 1:**
Realized with emergency off button, effecting the undervoltage release of the motor circuit breaker.
- **Optionally Emergency Off Function Category 4** (redundant tripping function and surveillance)
Safety relay, emergency off button with 2nd NCC, redundant tripping function and surveillance due to double undervoltage release and auxiliary contacts.



- **332.056.102**
Emergency Off with 2x NCC
- **332.237.402**
3phase Mains Panel type B for higher safety category 4
- **928.098.200**
Module with Safety Relay category 4



KP Mains Panel 16A 1phase 230V, RCD type A and Emergency Off



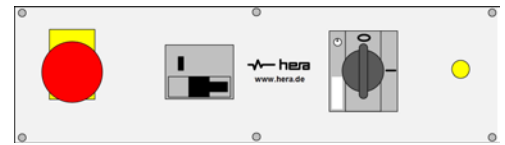
EP Mains Panel 16A 3phase, RCD type A and Emergency Off



MP Mains Panel 16A 1phase, RCD type A and Emergency Off with Key

KP/EP/MP MAINS PANEL 16A

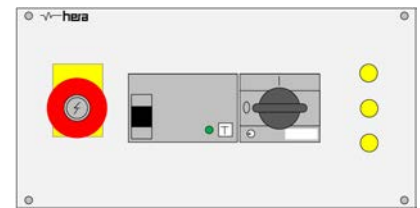
- Voltage control lamps.
- Motor circuit breaker and undervoltage release.
- Residual current device (RCD) 25A / 30mA type A.
- or: RCD 25A / 30mA type B
(recommended for equipment where residual current might have smooth DC portion).
- Emergency off button effecting the undervoltage release and 2nd NCC for the optional connection to the inhouse emergency off loop. Alternatively with black stop button.
- or: emergency off category 4 with redundant circuit breaking and surveillance with two motor circuit breakers with undervoltage release and auxiliary contacts.
- KP modules are available in horizontal and vertical position (for ENERGY extensions).
- Completely wired with input terminal and output coupler.



322.110.102 1phase, RCD type A (8KP)

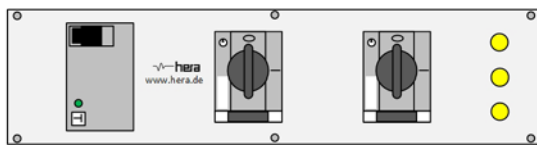


322.132.202 3phase, no RCD with black key button (6KP)



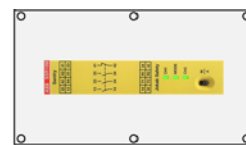
322.237.202 3phase, RCD type B (1EP)

Example for Mains Panel with Emergency Off Cat. 4:



322.131.402
Mains Panel 3phase, RCD type B for Emergency Off cat. 4 (9KP)

+



322.100.402
Panel with Safety Relay cat.4 (4KP)

+



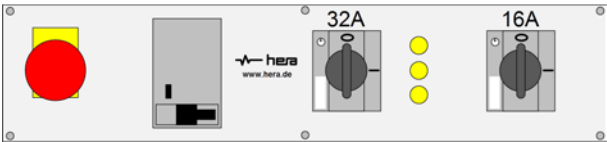
322.100.102
Emergency Off Button (1KP)

KP Mains Panel		322.1 P T N E 2	
P Phases	T RCD	N Emergency Off	E Tripping Current
1 1phase 230V	0 Type A (8KP)	0 Emergency Off with Key	0 horizontal / 12,5 - 16A
3 3phase 400V	1 Type B (8KP)	1 Emergency Off	2 horizontal / 9 - 12,5A
	2 no RCD (6KP)	2 Black Emergency Stop with Key	5 vertical / 12,5 - 16A
322.100.402: Module with Safety Relay cat. 4 (4KP)		6 Black Emergency Stop	7 vertical / 9 - 12,5A
		3 no Emergency Button (minus 1KP)	
		4 Emergency Off, cat.4 (plus 1KP) without Emergency Button	
322.1xx.xx8 Mains Panels 120V Versions			

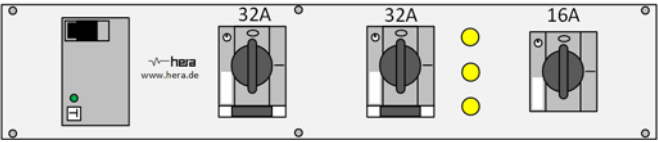
EP/MP Mains Panel		33 S .2 P T N 02	
S System	P Phases	T RCD	N Emergency Off
2 EP	1 1phase 230V	0 no RCD	0 no Emergency Button
5 MP	3 3phase 400V	5 Type A	1 Emergency Off Button
		7 Type B	2 Emergency Off Button with Key
332.200.402: Module with Safety Relay cat. 4 (0,5EP)			3 Black Emergency Stop Button with Key
335.200.402: Module with Safety Relay cat. 4 (0,5MP)			6 Black Emergency Stop Button
			4 Emergency Off cat. 4
33x.2xx.x08 Mains Panels 120V Versions			

KP/EP/MP MAINS PANEL 32A

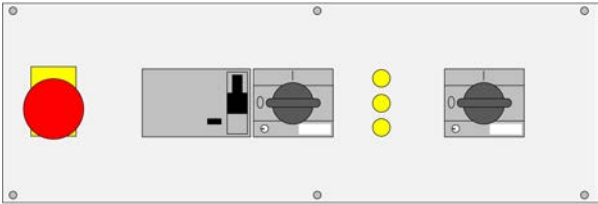
- 3x Voltage control lamps.
- Motor circuit breaker 32A and 16A with undervoltage release.
- Residual current device (RCD) 40A / 30mA type A.
- or: RCD 40A / 30mA type B (recommended for equipment where residual current might have smooth DC portion).
- Emergency off button effecting the undervoltage release and 2nd NCC for the optional connection to the inhouse emergency stop loop. Alternatively with black emergency stop button.
- or: emergency off category 4 with redundant circuit breaking and surveillance with two motor circuit breakers with undervoltage release and auxiliary contacts.
- 32A output terminal for connecting 32A modules.
- or: CEE socket 32A and safety jacks to tap 32A.
- Completely wired with input terminal and output coupler.



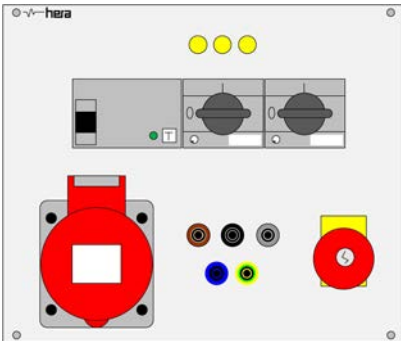
322.330.102 Mains Panel 32A with RCD type A (10KP)



322.331.402 Mains Panel 32A with RCD type B, emergency off cat. 4 (11KP)



332.435.104 (EP)
RCD type A, emergency off
cat. 4, 32A terminal



335.437.202 (MP)
RCD type B with CEE
socket 32A and jacks

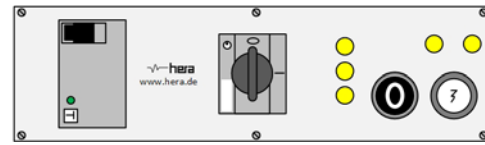


KP Mains Panel 32A			322.33 T . N E 2
T RCD	N Emergency Off	E Installation	
0 Type A (10KP)	0 Emergency Off Button with Key	0 horizontal	
1 Type B (10KP)	1 Emergency Off Button	5 vertical	
2 no RCD (8KP)	2 Black Emergency Stop Button with Key		
322.100.402:	6 Black Emergency Stop Button		
4 KP Module with Safety Relay cat. 4	3 no Emergency Button (minus 1KP)		
	4 Emergency Off cat. 4 (plus 1KP) Note: without Emergency Button		

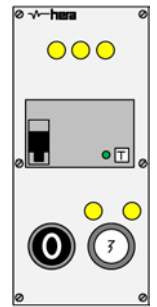
EP/MP Mains Panel 32A				33 S . 43 T . N O A
S System	T RCD	N Emergency Off	A Feature	
2 EP	0 no RCD	0 no Emergency Button	2 with CEE 32A + Safety Jacks	
5 MP	5 Type A	1 Emergency Off Button	4 with 32A Terminal	
	7 Type B	2 Emergency Off Button with Key		
332.200.402: Module with Safety Relay cat. 4 (0,5EP)		3 Black Emergency Stop Button with Key		
335.200.402: Module with Safety Relay cat. 4 (0,5MP)		6 Black Emergency Stop Button		
		4 Emergency Off cat. 4 Note: no Emergency Button		

KP/EP/MP MAINS PANEL WITH CONTACTOR ACTIVATION

- Voltage control lamps.
- Miniature circuit breaker (MCB) B16.
- or: motor circuit breaker (CB) with undervoltage release (UVR) for workstation-effective emergency stop (Note: without emergency stop button).
- Residual current device (RCD) 25A / 30mA type A.
- or: residual current device (RCD) 25A / 30mA type B (for educational labs complying VDE 0100-723).
- 1- or 2-level activation with on / off button, contactors and status indication.
- or: 1- or 2-level activation with contactors and status indication for the remote control from the instructors' bench.
- Completely wired with input terminal and output coupler.



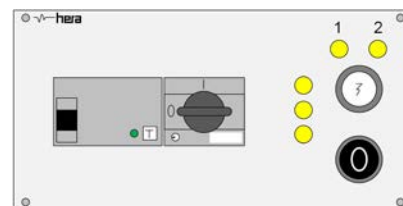
322.267.202 3phase CB, RCD type B and 2-level activation 8KP



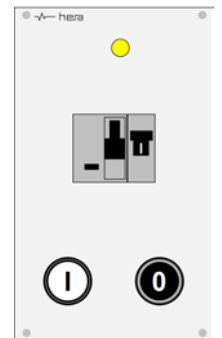
322.247.252 3phase, RCD type B, 2-level activation 5KP



322.287.202 3phase with MCB B16, RCD type B, 2-level activation 8KP



322.257.202 3phase with CB, RCD type B, 2-level activation 1EP



335.275.102 1phase with MCB B16, RCD type A, 1-level activation 1MP

KP Mains Panel with Contactor 322.2 P T F E 2

P Phase	T RCD	F Activation	E Position
2 1phase, without Circuit Breaker	0 no RCD	0 1-level with On /Off Button	0 horizontal
4 3phase, without Circuit Breaker	5 Type A	1 1-level with Key-On / Off Button	5 vertical
5 1phase, CB + UVR for Emergency Stop	7 Type B	2 2-level with Key-On / Off Button	
6 3phase, CB + UVR for Emergency Stop		4 1-level, for Remote Control (no Buttons)	
7 1phase MCB B16		5 2-level, for Remote Control (no Buttons)	
8 3phase MCB B16			

322.2xx.x08 Mains Panels 120V Versions

EP/MP Mains Panel with Contactor 33 S 2 P T F 02

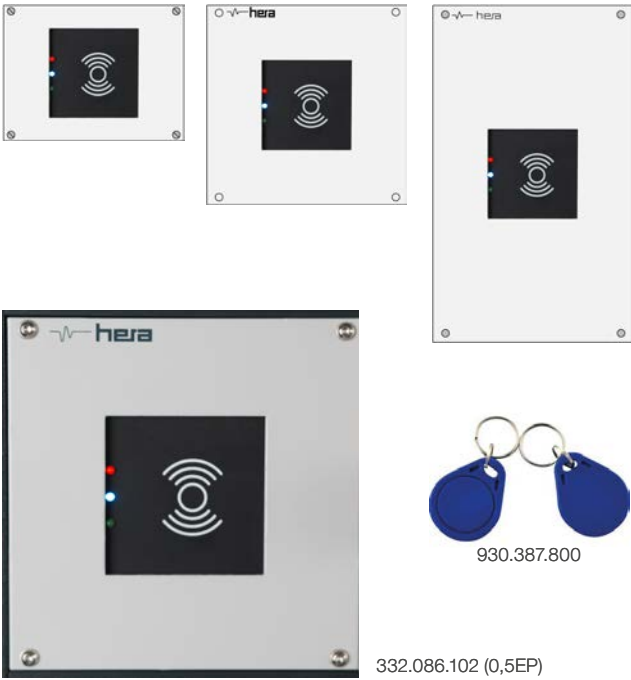
S System	P Phase	T RCD	F Activation
2 EP	2 1phase, without Circuit Breaker	0 no RCD	0 1-level with On /Off Button
5 MP	4 3phase, without Circuit Breaker	5 Type A	1 1-level with Key-On / Off Button
	5 1phase, CB + UVR for Emergency Stop	7 Type B	2 2-level with Key-On / Off Button
	6 3phase, CB + UVR for Emergency Stop		4 1-level, for Remote Control (no Buttons)
	7 1phase MCB B16		5 2-level, for Remote Control (no Buttons)
	8 3phase MCB B16		

33x.2xx.x08 Mains Panels 120V Versions

KP/EP/ MP RFID MODULE FOR ACTIVATION

- Max. 250 programmable cards or chips.
- Suitable for customer specific tags:
64 Bit Read Only in 125kHz system
(EM4100, EM4102).
- Managing app for adding / deleting RFID tags (cards, chips, etc) via rear sided USB interface.
- Admin card for the programming of more RFID tags.
- 3x status led and buzzer.
- Output relays.
- Incl. 2 cards.

RFID Module for Activation	
322.100.802	RFID Module (3KP)
332.086.102	RFID Module (0,5EP)
335.086.102.	RFID Module (1MP)
930.387.800	Transponder Chip with Ring for Key



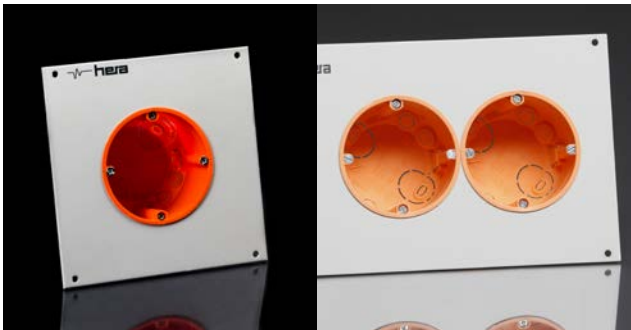
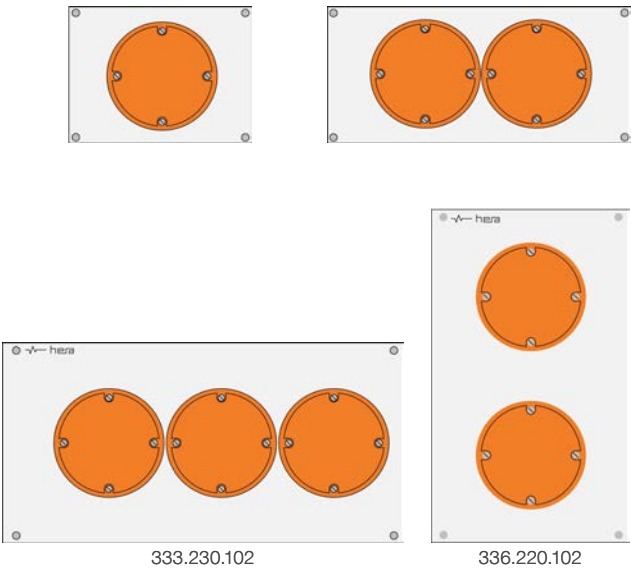
KP/EP/MP CAVITY BOX

- Module with cavity box for the flexible equipment with installaton components.

KP Cavity Box	
321.1	A 0.002
A No. of Cavities	
1	3KP
2	5KP
3	7KP

EP/MP Cavity Box	
33	S BB0.102
S System	
3	EP
6	MP
BB Width	
12	1x Cavity Box (0,5EP)
22	2x Cavity Box (1EP / 1MP)
23	3x Cavity Box (1EP)

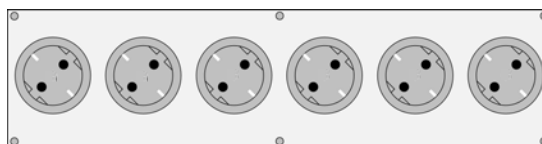
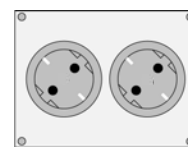
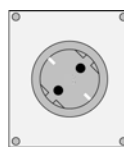
Equipment for Cavity Box	
333.220.500	Cover, 1fold
333.220.502	Cover, 2fold
333.220.510	TV Antenna Socket, 2 holes
333.220.520	SAT Antenna Socket, 3 holes
333.220.530	Double UAE Socket RJ45
333.220.540	TAE Socket 6F
333.220.550	red Schuko Socket with Label Field
333.220.560	USB-Charging Socket, 2x 2,4A



KP SOCKET PANEL, NO SWITCH (TYPE F)

- Sockets type F with protective earth, 45° positioned.
- With wire harness and couplers.

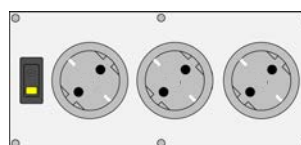
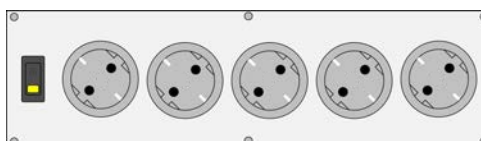
Socket Panel Type F, no Switch 323.0 A 0.0 E 2			
A No. of Sockets		E Position	
1	2KP	4	6KP
2	3KP	5	8KP
3	5KP	6	9KP
		0	horizontal and vertical right
		5	vertical left



KP SOCKET PANELS WITH SWITCH (TYPE F)

- Sockets type F with protective earth, 45° positioned.
- Illuminated 2poles switch for central on/ off.
- With wire harness and couplers.

Socket Panel Type F with Switch 323.0 A 1.0 E 2			
A Number of Sockets		E Position	
1	2KP	4	7KP
2	4KP	5	8KP
3	5KP	6	10KP
		0	horizontal and vertical right
		5	vertical left



IT SOCKET PANEL

All KP socket modules are available for supply of IT equipment.

- With red front panel or red frame.
- Not connected to the mains panel but with separate terminal clamp.

IT Sockets	323.xxx.xx6
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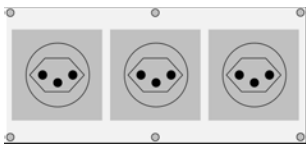


KP INTERNATIONAL SOCKET PANELS

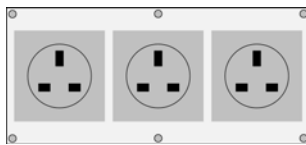
- Socket panels with international standards, dimensions 60 x 60mm.
- Socket panels with / without illuminated 2poles switch for central on/off.
- All socket panels are optionally available as IT socket panels with red front panel or frame, with separate terminal and not connected to the mains panel.
- Other international sockets on demand!



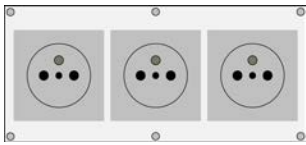
Sockets with Flap



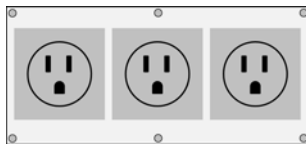
Type J 230V / 10A (Swiss)



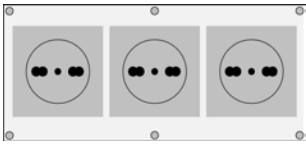
Type G 240V / 13A (British)



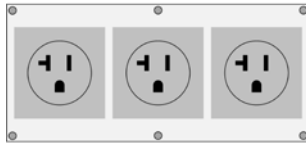
Type E 230V / 16A (Franco-Belgian)



NEMA 5-15R 125V / 15A (USA)



Type L 230V / 10A (Italian)



NEMA 6-20R 250V / 20A (USA)

International Socket Panels 323.0 A S L E F

A	Sockets, No.	S	Switch	L	Type	E	Position	F	Version
1	2KP	0	no Switch	2	Type F with Flap	0	horizontal	2	Standard
2	3KP	1	with Switch	3	Type J No. 23 (16A) - Swiss	5	vertical	6	IT (red)
3	5KP			4	Type J No. 13 (10A) - Swiss	928.047.700: 4x Type I, vertical (6KP), Chinese 928.103.400: 1x Type D + 6A CB, Indian (5KP)			
4	6KP			5	Type E 230V / 16A - Franco/ Belgian				
5	8KP			6	Type L 230V / 10A - Italian				
6	9KP			7	Type G 240V / 13A - British				
				8	NEMA 5-15 125V / 15A - USA				
				9	NEMA 6-20 250V / 20A - USA	Other types on demand!			

KP PANEL WITH EQUIPOTENTIAL BONDING

- Module with jack for equipotential bonding POAG-ID6.
- Wired to the PE of the terminal clamp.
- With connecting cable and lab plug.



321.300.200:
Equipotential Bonding (1KP)



321.300.000:
Lab Plug



321.300.100:
Lab Cable

KP Panel with Equipotential Bonding

321.300.200	Panel with Equipotential Bonding POAG (1KP)
331.300.200	Panel with Equipotential Bonding POAG (0,25EP)
321.300.000	Lab Plug POAG M6 with Color Code
321.300.100	100cm yellow / green Lab Cable

KP PANEL WITH CABLE INSERT

- Panel with plastic cable access insert 60mm and clipped cover segment.
- Panels with Cable gland M20 / M25.

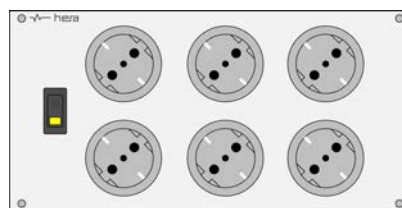


KP Panel with Cable Insert

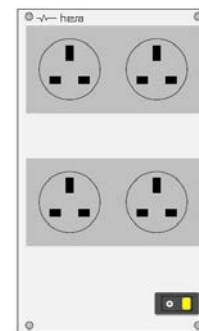
321.210.002	Cable Access Insert, light grey, 60mm (2KP)
321.210.102	Cable Access Insert, anthracite, 60mm (2KP)
321.201.002	1x Cable Gland M20 (1KP)
321.202.002	2x Cable Gland M20 + M25 (1KP))

EP/ MP SOCKET PANELS WITH SWITCH

- Sockets type F with protective earth, 45°positioned.
- International sockets with protective earth and mounting frame.
- Illuminated 2poles switch for central on/ off.
- With wire harness and couplers.
- Other types on demand!



333.261.102 Type F (1EP)



336.241.172 (1MP)

D Type

Type J
SwissType E
Franco/BelgianType L
ItalianType G
BritishNEMA5-15
USANEMA6-20
USA

Examples: EP/ MP Socket Panels with Switch

333.121.102
(0,5EP)

333.221.172 (1EP)



333.421.102 (2EP)

336.221.102
(0,5MP)

Socket Panel with Switch

33 S AA1.1 D 2

S System

3	EP	12	2x Sockets (0,5EP)
6	MP	22	3x Sockets (1EP / 0,5MP)
		24	4x Sockets (1EP / 1MP)
		26	6x Sockets (1EP / 1MP)
		42	5x Sockets (2EP)

930.158.000: 6x Type I with Switch (1EP), Australian/ Chinese

930.207.600: 4x Type I (0,75EP, Australian/ Chinese)

930.254.400: 3x Type I with Switch (1EP), Australian/ Chinese

930.385.000: 4x Type I with Flap (1EP), Australian/ Chinese

930.402.700: 2x Type D with 5A Circuit Breaker (0,75EP), Indian

D Type

0	Socket Type F
2	Socket with Flap, Type F
3	Socket Type J, No. 23 (250V / 16A)
4	Socket Type J, No. 13 (250V / 10A)
5	Socket Type E 230V / 16A
6	Socket Type L 230V / 10A
7	Socket Type G 240V / 13A
8	USA NEMA 5-15 125V / 15A
9	USA NEMA 6-20 250V / 20A

IT Sockets

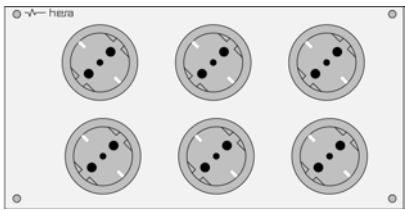
red frame and terminal for separate connecting cable

33X.XXX.XX3

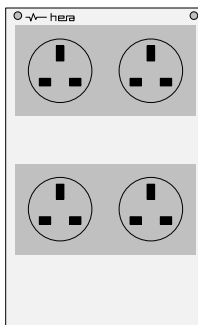


EP/ MP SOCKET PANELS WITHOUT SWITCH

- Sockets type F with protective earth, 45°positioned.
- International sockets with protective earth and mounting frame.
- With wire harness and couplers.
- Other types on demand!



333.331.102 (1EP)

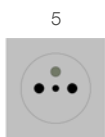


336.131.172 (1MP)

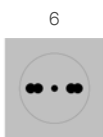
D Steckdose



Type J
Swiss



Type E
Franco/Belgian



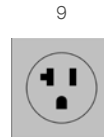
Type L
Italian



Type G
British



NEMA5-15
USA



NEMA6-20
USA

Examples: EP/ MP Socket Panels without Switch



333.031.102
(0,25EP)



333.131.102
(0,5EP)



333.231.102 (1EP)



333.431.102 (2EP)



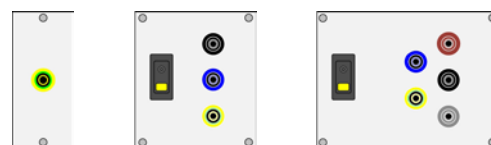
336.231.102 (0,5MP)

Socket Panel without Switch		
33 S A 31.1 D 2		
S System	A Version	D Type
3 EP	0 2x Sockets (0,25EP)	0 Socket Type F
6 MP	1 4x Sockets (0,5EP, Intern. 0,75EP)	2 Socket with Flap, Type F
	2 3x Sockets (1EP / 0,5M)	3 Socket Type J, No. 23 (250V / 16A)
	3 6x Sockets (1EP / 1MP)	4 Socket Type J, No. 13 (250V / 10A)
	4 6x Sockets (2EP)	5 Socket Type E 230V / 16A
		6 Socket Type L 230V / 10A
		7 Socket Type G 240V / 13A
		8 USA NEMA 5-15 125V / 15A
		9 USA NEMA 6-20 250V / 20A
930.411.800: Autotransformer 240V - 110V with 13A fuse (0,5EP)		
930.438.600: Autotransformer 110V - 240V (0,5EP)		
IT Sockets 33X.XXX.XX3 red frame and terminal for sepeare connecting cable		



KP AC MODULE WITH SAFETY JACKS

- 4mm safety jacks.
- Optionally with illuminated switch, 3phase-type with downstream contactor.
- With wire harness and couplers.



AC Module with Safety Jacks

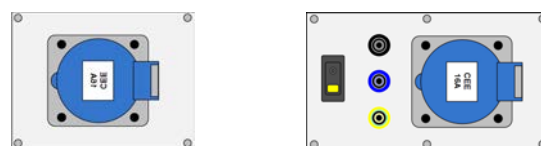
323.5 **PS** .002

PS Type

00	PE Jack green/yellow (1KP)	11	1phase / with Switch (2KP)	31	3phase / with Switch (3KP)
01	ESD Jack white (1KP)	30	3phase / no Switch (2KP)	51	3phase / with Rotation Switch (4KP)
10	1phase / no Switch (1KP)				

KP MODULE WITH 1PHASE CEE SOCKET

- Blue CEE socket, straight 6h 3poles 230V / 16A.
- Optionally with illuminated switch, key-switch type with downstream contactor.
- Optionally with 4mm safety jacks (L, N, PE).

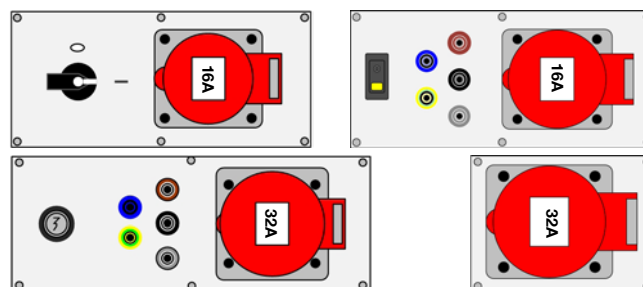
Module with 1phase CEE Socket 323.10 **S.B** 02

S.B Type

0.0	no Switch / no Jacks (3KP)	1.0	with Switch / no Jacks (4KP)	2.0	with Key Switch / no Jacks (4KP)
0.1	no Switch / with Jacks (3KP)	1.1	with Switch / with Jacks (5KP)	2.1	with Key Switch / with Jacks (5KP)

KP MODULE WITH 3PHASE CEE SOCKET

- Red CEE socket, straight 6h, 5poles 400V.
- Optionally with illuminated switch, key-switch type with downstream contactor.
- or: 3poles rotation switch.
- Optionally with 4mm safety jacks (L1, L2, L3, N, PE).
- With wire harness and couplers.



Module with 3phase CEE Socket

323.1 **VW** . **B** 02

V Type

3	16A
5	32A

W Switch

0	no Switch (3KP)	5	Rotating Switch (16A: 4KP / 32A: 5KP)
1	Illuminated Switch (4KP)	6	Rotation Field Selector (5KP)
2	Key Switch (5KP)		(right / off / left)

B Jacks

0	no Jacks
1	with Jacks (+ 1KP)



EP/ MP MODULE WITH 1PHASE CEE SOCKET

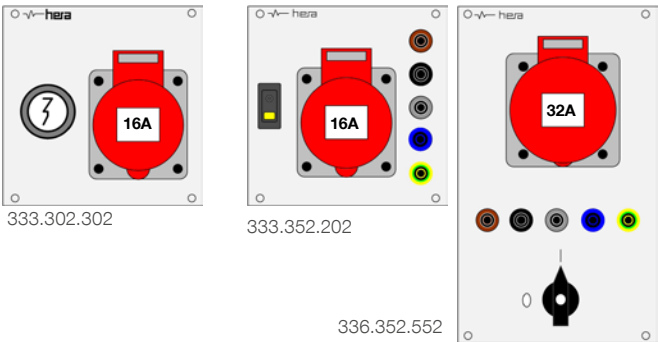
- Blue CEE socket, straight 6h 3poles 230V / 16A.
- Optionally with illuminated switch, key-switch type with downstream contactor.
- Optionally with 4mm safety jacks (L, N, PE).
- With wire harness and couplers.



Module with 1phase CEE Socket			
33 S AA 2. W 02			
S System	AA Type	W Switch	
3 EP	00 PE Jack (0,25EP / 0,5MP)	13	Jacks and CEE (0,5EP / 1MP)
6 MP	03 Safety Jacks (0,25EP / 0,5MP)	23	Jacks and CEE (1EP)
	10 CEE (0,5EP / 1MP)	1	no Switch
		2	with Switch
		3	with Key-Switch

EP/ MP MODULE WITH 3PHASE CEE SOCKET

- Red CEE socket, straight 6h, 5poles 400V.
- Optionally with illuminated switch, key-switch type with downstream contactor.
- or: 3poles rotation switch.
- Optionally with 4mm safety jacks (L1, L2, L3, N, PE).
- With wire harness and couplers.



Module with 3phase CEE Socket			
33 S AA 2. W C 2			
S System	AA Type	W Switch	C Current
3 EP	05 Jacks (0,25EP / 0,5MP)	35	Jacks and CEE (0,5EP / 1MP)
6 MP	30 CEE (0,5EP / 1MP)	45	Jacks and CEE (1EP)
		1	no Switch
		3	with Key-Switch
		2	with Switch
		5	with Rotation Switch
		6	Rotation Field Selector (right / off / left)
		0	16A
		5	32A

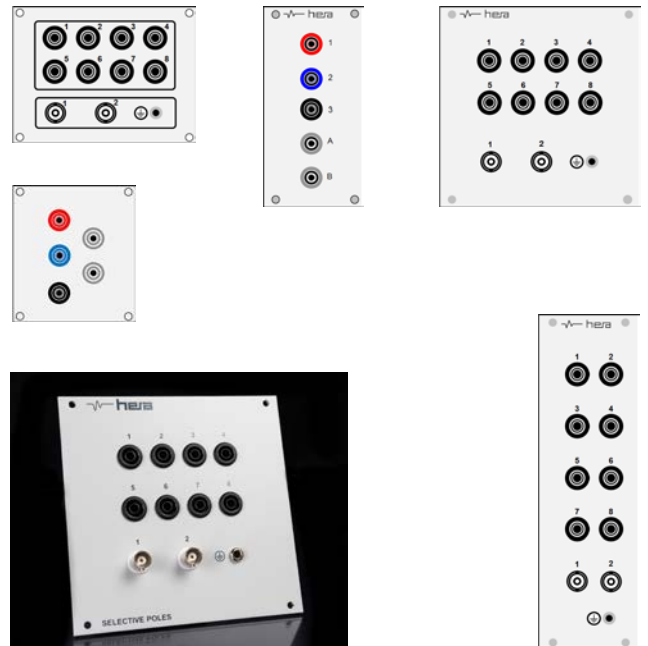


KP/EP/MP MODULE WITH SELECTIVE POLES

- Selective poles are applicable for educational labs, if voltage signals from the instructor bench should be distributed to the trainees benches. Selective poles are unwired and need to be connected on-site.
- 4mm safety jacks (SLB).
- BNC sockets.

KP Selective Poles		323.8	A	0.0	E	2
A	Type					
E	Position					
0	5x Jacks (2KP)					
1	8x Jacks + 2x BNC (3KP)					
0	horizontal					
5	vertical					

EP/MP Selective Poles		33	S	.850	A	02
S	System					
A	Type					
3	0,25EP / 0,5EP					
1	5x Jacks					
6	0,5MP					
2	8x Jacks + 2x BNC					



KP/EP/MP MODULE WITH CONTINUITY TESTER

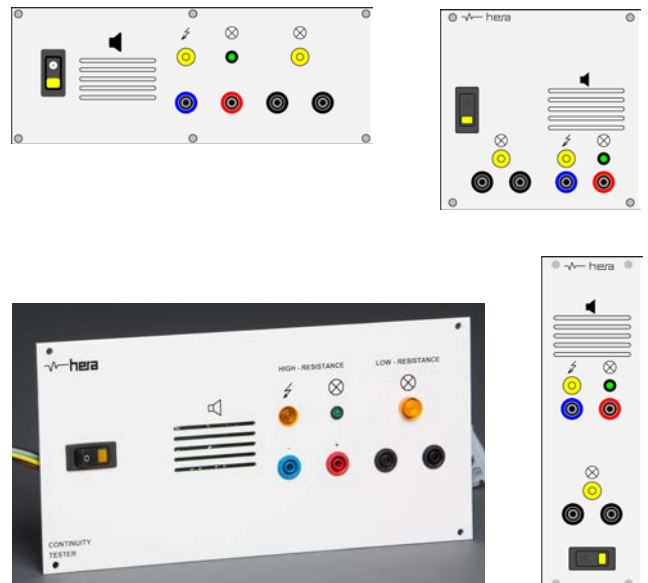
High-ohmic electric continuity test, poled:

- Resistance range: 0...200kΩ with accoustic (sound alternation with changing resistance) and optic signal.
- External voltage protection (> 400V) and signal lamp indication.

Low-ohmic electric continuity test with 24VAC:

- Signal lamp for indication.
- 4mm safety jacks for connection.
- Illuminated 2poles switch for central on /off.

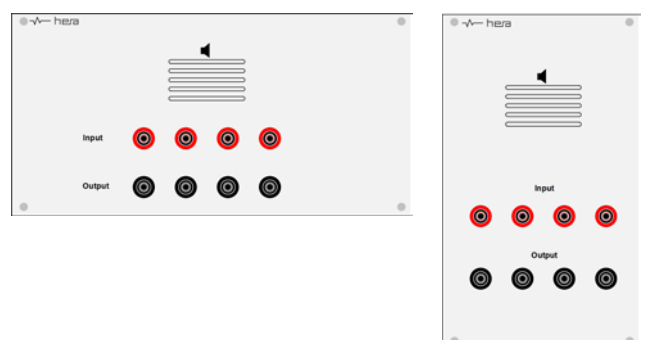
Module with Continuity Tester	
327.100.002	6KP horizontal
327.100.052	6KP vertical
334.121.602	0,5EP
337.121.602	0,5MP



EP/MP MODULE WITH TEST SPEAKER

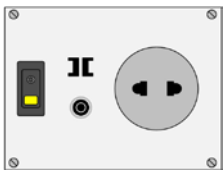
- Test speaker 10W / 8Ω.
Transmission range: 130-20.000Hz.
- Upstream transmitter for impedance matching.
Transmission range: 40 - 20.000Hz.
Primary winding: 2kΩ / 4kΩ / 8kΩ / 16kΩ.
Secondary winding: 4Ω / 8Ω / 16Ω.
- 4mm safety jacks for connection.

Module with Test Speaker	
334.090.302	1EP
337.090.302	1MP

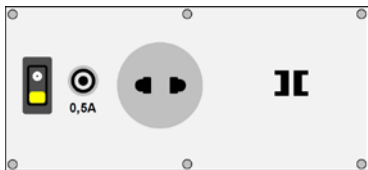


KP/EP/MP MODULE WITH ISOLATING TRANSFORMER

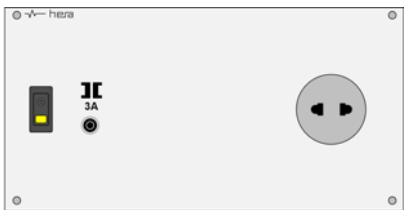
- KP module with isolating transformer for the supply of floating 230VAC. The tranformer for the 700VA is seperately housed and optionally in an instrument rack or cable tray of the bench.
- EP / MP module with isolating transformer for floating 230VAC.
100VA isolating transformer (88 x 66 x 61mm).
115VA isoltating transformer (110 x 100x 85mm).
700VA iron core transformer (165 x 70mm).
- Protected by a front-side operated thermomagnetic fuse.
- Output at universal socket (Type F / Franco-American) without protective earth.
Optionally with selector switch for safety jacks and LED indication.
- Illuminate 2poles switch for central on /off.



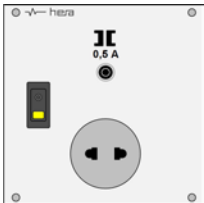
325.700.002 700VA (3KP)



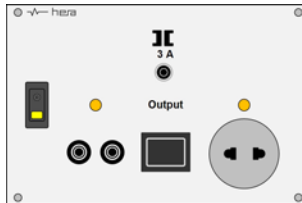
325.115.002 115VA (5KP)



333.010.302 100VA (1EP)



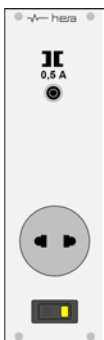
333.012.302 115VA (0,5EP)



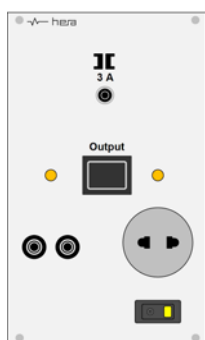
333.170.302 700VA (0,75EP)

KP Module Isolating Transformer		325.AAA.0 E 2	
AAA Type		E Position	
115	115VA / 0,5A (5KP)	0	horizontal
700	700VA / 3A (3KP)	5	vertical

EP/MP Module Isolating Transformer		33 S AAA.302	
S System		AAA Type	
3	EP	010	100VA / 0,43A, for Energy Channel (1EP)
6	MP	012	115VA / 0,5A (0,5EP / 0,5MP)
		112	115VA / 0,5A, Jacks + Socket (0,75EP / 1MP)
		070	700VA / 3A (0,5EP / 0,5MP)
		170	700VA / 3A, Jacks + Socket (0,75EP / 1MP)
33x.xxx.308		120V Version	



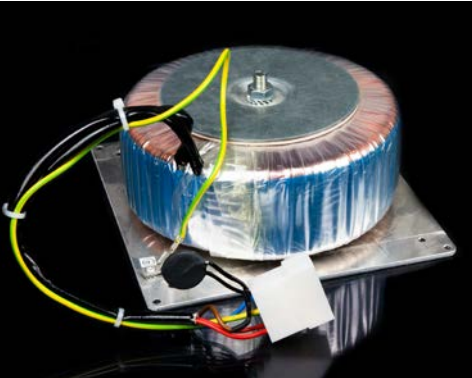
336.012.302 115VA (0,5MP)



336.170.302 700VA (1MP)



KP Module with Univeral Socket and Isolating Transformer 115VA



700VA Isoltating Transformer and Inrush Current Limiter

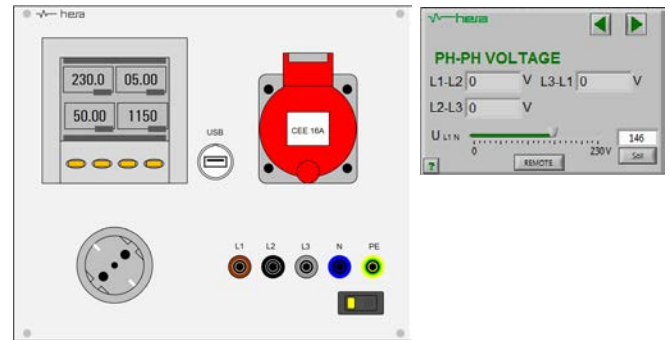
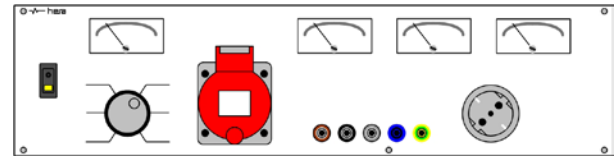


EP Module with Universal Socket and Isolating Transformer 115VA

EP/MP MEASURING MODULE

The module is for measuring and testing the parameter of the connected 1phase and 3phase AC loads.

- Analog or digital voltage readings with measuring point selector.
- 3x analog or digital voltage current readings (L1, L2 and L3).
- Analog readings: moving iron, class 1,5.
- Digital readings: 3digit LED; TrueRMS; 0,5% +/-1 digit.
- or MFD: multifunctional display with graphic-LCD, four variably programmable readings and four control buttons.
- CEE socket, straight 400V/ 16A, 6h, 5poles.
- 4mm safety jacks (L1, L2, L3, N and PE).
- Integrated type F socket (other optionally).
- Illuminated switch for central on /off.



Measuring Module		33	S 389.	AA 2
S	System	AA	Type	
4	EP	10	Analog (2EP / 2MP)	
7	MP	40	Digital TrueRMS (1,5EP / 2MP)	
		60	MFD, no Interface (1,5EP / 2MP)	
		63	MFD, USB Interface (1,5EP / 2MP)	
		65	MFD, LAN Interface (1,5EP / 2MP)	

Technical Data to Multifunctional Display:

- Display 96 x 96mm with graphic-LCD 128 x 80 pix and 4 control buttons.
- Voltage TRMS (phase -, system - and phase-to-phase voltages); accuracy: $\pm 0,2\%$.
- Phase current TRMS (calculated current of neutral); accuracy: $\pm 0,2\%$.
- Power (active -, reactive -, apparent power each phase and in total), accuracy: $\pm 0,5\%$ of active values.
- Power factor (each phase and in total); accuracy: $\pm 0,5\%$.
- Frequency (frequency measurement of measured voltage); accuracy: $\pm 0,05\%$.
- High - and Low value of the actual measured voltage, current, power, power factor and frequency.
- Total harmonic distortion (THD) of voltages and currents.
- Harmonic analyse of currents and voltages up to 31rd harmonic wave.
- Counter for active -, reactive - and apparent power (part - and total counter with programmed tariff functions).
- Hour counter (total- and service hours, programmable).



DATA LOGGING - A STEP TO MORE DIGITALIZATION

The ongoing digitalization requires the documentation of many industrial processes, so data logging and data evaluation is mandatory. In order to avoid unnecessary cables using up your workspace, we offer a broad variety of interfaces already integrated in the workstation with hidden cable runs.



10

11

12

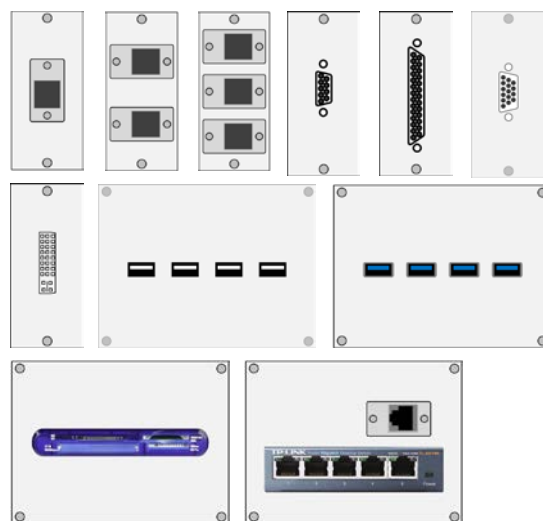
13

KP/EP/MP MODULES WITH INTERFACES

- Modules with interfaces for clearly arranged cable runs.
- Keystone adapters are universal and can be flexibly equipped with Keystone modules.

KP Interface Modules

324.010.002	1x Keystone Adapter, no Module (1KP)
324.020.002	2x Keystone Adapters, no Module (1KP)
324.030.002	3x Keystone Adapters, no Modules (1KP)
324.200.002	1x Sub-D 9poles Plug for COM/RS232 (1KP)
324.210.002	1x Sub-D 25poles Socket for LPT (1KP)
324.220.002	1x Sub-D 15poles Socket for VGA (1KP)
324.230.002	1x DVI-I-Socket, Digital Visual Interface (1KP)
324.400.002	Active 4fold USB-Hub 2.0 incl. Power Supply (3KP)
324.410.002	Active 4fold USB-Hub 3.0 incl Power Supply (3KP)
324.420.002	Active 4fold USB-Hub 3.0 for ENERGY Profile 45° (4KP)
324.500.002	Card Reader USB 2.0 56in1 incl. Power Supply (3KP)
324.802.005	Gigabit Ethernet Switch 5 Port incl. Power Supply (3KP) Cat. 6 Coupler and Patch Cables 15cm

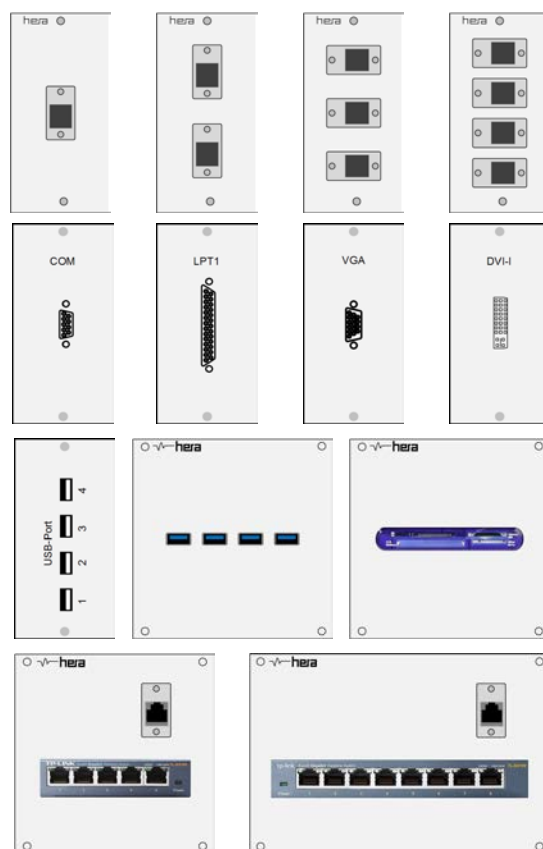


EP/MP Interface Modules

SSS .AAA .AAA

SSS System AAA .AAA Type

333	EP	810.002	1x Keystone Adapter (0,25EP/0,5MP)
336	MP	820.002	2x Keystone Adapter (0,25EP/0,5MP)
		830.002	3x Keystone Adapter (0,25EP/0,5MP)
		840.002	4x Keystone Adapter (0,25EP/0,5MP)
		803.102	1x Sub-D 9poles Plug for RS232 (0,25EP/0,5MP)
		803.302	1x Sub-D 25poles Socket for LPT (0,25EP/0,5MP)
		803.502	1x Sub-D 15poles Socket for VGA (0,25EP/0,5MP)
		803.702	1x DVI-I- Socket (0,25EP/0,5MP)
		805.302	USB-Hub 4fold 2.0 incl. Power Supply (0,25EP/0,5MP)
		805.402	USB-Hub 4fold 2.0, for Energy Channel (0,5EP)
		805.502	USB-Hub 4fold 3.0 incl. Power Supply (0,25EP/0,5MP)
		805.702	Card Reader USB2.0 56in1 (0,5EP/0,5MP)
		802.005	Gigabit Ethernet Switch 5 Port (0,5EP/0,5MP) Cat. 6 Couplers and Patch Cables 15cm
		802.008	Gigabit Ethernet Switch 8 Port (0,75EP/0,5MP) Cat. 6 Couplers and Patch Cables 15cm
330.802.005			Gigabit Network Switch 5-Port, max. 1000 Mbit/s with Power Supply; 100x98x25mm (LxWxH)
330.802.008			Gigabit Network Switch 8-Port, max. 1000 Mbit/s with Power Supply 158x101x25mm (LxWxH)
330.802.016			Gigabit Network Switch 16-Port, max. 1000 Mbit/s with Power Supply 294x180x44mm (LxWxH)
330.802.024			Gigabit Network Switch 24-Port, max. 1000 Mbit/s with Power Supply 280x180x44mm (LxWxH)



KEYSTONE MODULES

- The Keystone system consists of an universal Keystone adapter for snapping-in a Keystone module.
- The Keystone modules can be equipped with cables in different length.
- The Keystone modules can be variably exchanged if other connector is required.

Keystone Modules			
330.800.000	Blank Cover	330.830.500	USB 3.0 C female > male with cable
330.810.100	RJ45 Coupler Cat. 5e	330.830.600	USB Type-A Charging female 1A black
330.810.200	RJ45 Coupler Cat. 6A	330.840.100	HDMI female > HDMI female black
330.810.3F0	RJ45 female > LSA (Insulation displacement) Cat.6 (F=0: black; 1: red; 2: green; 3: yellow; 4: blue)	330.840.300	mini Display Port female > male with cable
330.810.400	RJ45 female > LSA (Insul. displ.) Cat.6 shielded	330.850.100	3,5mm Jack female > female gold-plated
330.820.100	Optical Fibre LC Duplex female > female	330.850.2F0	Cinch female > Cinch female (F=0: yellow; 1: red; 2: white)
330.820.200	Optical Fibre SC Simplex female > female	330.860.100	BNC female > BNC female black
330.830.100	USB 2.0 A-female > B-female	330.860.200	F female > F female (SAT Antenna)
330.830.300	USB 3.0 A-female > B-female	330.860.300	IEC female > F female (SAT Antenna)
		330.860.400	IEC male > F female (SAT Antenna)



KP/EP/MP MODULE WITH ANALOG SOLDERING STATION

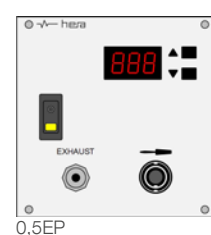
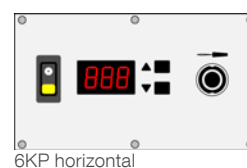
- Professional Weller soldering station 24V/ 80W with electric temperature control.
- Stepless adjustable temperature control via potentiometer between 150°C and 450°C with temperature control LED.
- Antistatic soldering tool WSP80 of Weller.
- Stand with sponge.
- Connector for soldering fume extractor.
- Version for 120V available!

Analog Soldering Station	
327.000.002	4KP (horizontal)
327.000.052	4KP (vertical)
334.152.103	0,5EP
334.252.103	1EP (fits in Energy Channel)
337.152.103	0,5MP



KP/EP/MP MODULE WITH DIGITAL SOLDERING STATION

- Microprocessor controlled Weller soldering station (24V / 80W) with automatic soldering tool identification.
- Stepless adjustable temperature control with up/ down button, adjustable between 50°C and 450°C.
- 3digit LED display for nominal and actual temperature.
- Antistatic soldering tool WSP80 of Weller.
- Stand with sponge.
- Connector for soldering fume extractor.
- Version for 120V available!



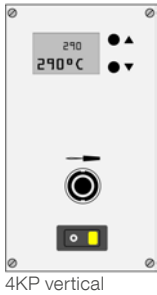
Digital Soldering Station	
327.005.002	4KP horizontal
334.153.103	0,5EP
337.253.103	1MP



KP/EP/MP LCD SOLDERING STATION

Microprocessor controlled ERSA soldering station with stand-by shut-down for saving energy and more durability. Three fixed temperature settings and stepless adjustable temperatures.

- Electrically controlled soldering station, 80W.
- Stepless adjustable temperature between 150 and 450°C.
- LCD display for actual and nominal temperature.
- Antistatic soldering tool according to MIL-SPEC/ESA.
- Powerful fine soldering tool (warm-up 9sec).
- Antistatic stand with dry-cleaner wire mesh.
- Version for 120V available!



4KP vertical

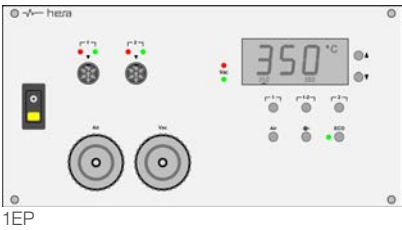


0,5EP

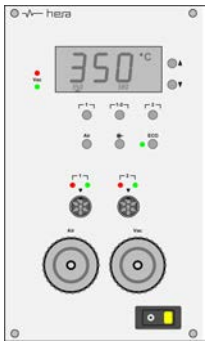
LCD Soldering Station	
327.020.002	4KP vertical
334.154.103	0,5EP
337.154.103	1MP
960.010.019	5x Soldering Tips (lead-free soldering)

EP/MP UNIVERSAL SOLDERING / DESOLDERING STATION

- Universal repair station for the professional work with electronic moduls.
- The station has two individual tool-specific channels with automatic tool identification and activation of the respective control parameters. Soldering and desoldering or soldering with hot air is possible at the same time.
- Integrated rotary vane pump for suction or flow (max. vacuum 0,7bar, max. flow quantity 18l/min.).
- Freely programmable buttons for repeating functions.
- LC-display / EGB safe / ECO function.
- Temperature control: 50°C – 550°C.
- For a variety of Weller soldering tools up to 200W.



1EP



1MP

Soldering / Desoldering Station and Accessory	
334.254.102	Soldering / Desoldering Station (1EP)
337.254.102	Soldering / Desoldering Station (1MP)
930.362.900	Soldering / Desoldering Station 120V (1MP)
380.000.100	Soldering Tool Set 80W
380.000.200	Soldering Tool Set 120W
380.000.300	Desoldering Tool Set 80W
380.000.400	Desoldering Tool Set 120W
380.000.500	Hot Air Pencil Set 100W
960.010.003	Set of 5 Soldering Tips (Weller)
960.010.018	Tip for Hot Air Pencil (3mm)
960.010.005	Set of Solder Accessories (500g Solder, 1,6m Solder Wick, Desolde- ring Pump, 100ml Electric Flux, Soldering Tip Cleaner, 5x Sponge for Solder)



10



Soldering Tool Set



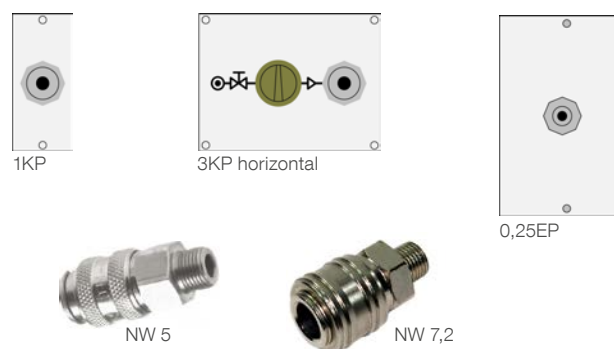
Desoldering Tool Set



Hot Air Pencil Set

KP/EP/MP PRESSURED AIR CONNECTORS

- Self-closing pressured air connectors.
- Connector with outer G 1/4".
- Safety coupler: the system needs to be vented by turning the releasing sleeve, only then the connector can be opened.
- Option upstream closing valve:
Incl. hosing, for remote controlled pressured air supply, in off-mode closed and vented)

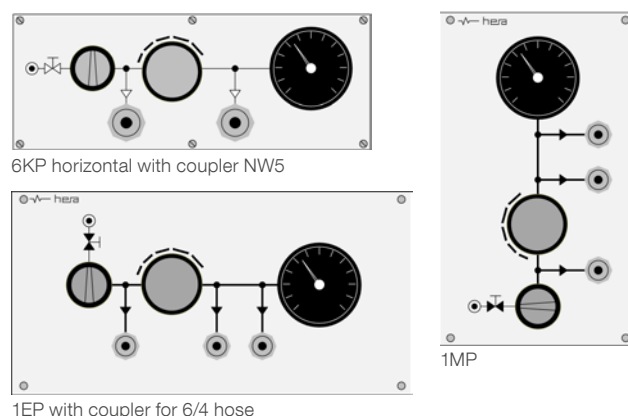


KP Pressured Air Connector	
323.710.002	Hose Coupler 6/4 (1KP)
323.711.002	Hose Coupler 8/6 (1KP)
323.712.002	Quick Release Coupler NW5 (1KP)
323.713.002	Quick Release Coupler NW7,2 (1KP)
323.720.002	with closing valve for hose 6/4 (3KP)
323.721.002	with closing valve for hose 8/6 (3KP)
323.722.002	with closing valve NW5 (3KP)
323.723.002	with closing valve NW7,2 (3KP)

EP / MP Pressured Air Connector	
334.260.102	Hose Coupler 6/4 (0,25EP)
334.260.202	Hose Coupler 8/6 (0,25EP)
334.260.302	Quick Release Coupler NW 5 (0,25EP)
334.260.402	Quick Release Coupler NW 7,2 (0,25EP)
334.260.502	FESTO Safety Coupler NW 7,85 (0,25EP)
334.260.000	Option: Upstream Closing Valve (0,25EP)
930.339.900	Quick Release Coupler NW 7,2 (0,5MP)

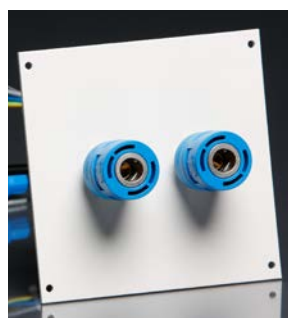
KP/EP/MP PRESSURED AIR CONTROL

- Closing valve.
- Adjustable pressured air control with pressure gauge.
- 6/4- or 8/6- self-closing coupler:
1x uncontrolled outlet + 2x controlled outlet.
- NW5- or NW7- self-closing coupler:
1x uncontrolled outlet + 1x controlled outlet.
- Completely hosed and connecting hose with open end.



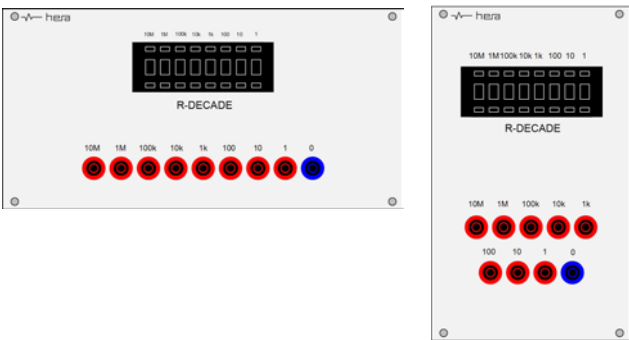
KP Pressured Air Control		323.75	B	A	E	2
B Pressure	A Outlet	E Position				
1 0 - 3 bar (6KP)	0 6/4 Hose Coupler.	0	horizontal			
0 0 - 10bar (6KP)	3 8/6 Hose Coupler.	5	vertical			
	5 NW5 Coupler with 8/6 Hosing					
	7 NW7 Coupler with 8/6 Hosing					

EP/MP Pressured Air Control				33	S	.26	A	B	02
S System		A Outlet		B Position					
4	1EP	2	6/4 Hose Coupler.	1	0 - 3bar				
7	1MP	1	8/6 Hose Coupler.	2	0 - 10bar				
		5	NW5 Coupler with 8/6 Hosing						
		7	NW7 Coupler with 8/6 Hosing						



KP/EP/MP R-DECADE

- 8x decade switches with precision resistors from 1Ω to 10MΩ.
- Accuracy: 0,1% + 100mΩ.
- Max. voltage: 200V AC; max. current: 0,5A.
- 9x 4mm safety jacks to tap the resistances.

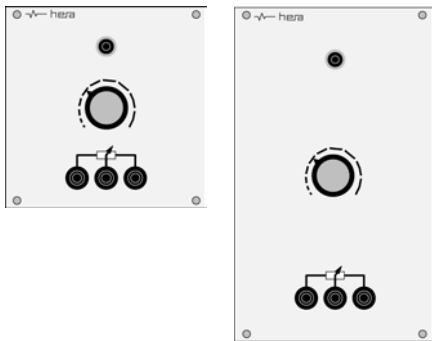


R-Decade	
324.441.102	6KP horizontal
334.441.102	1EP
337.441.102	1MP

KP/EP/MP LOAD RESISTOR

- Stepless adjustable potentiometers 50W.
- Thermal fuse for overload protection.
- 3x 4mm safety jacks to tap the resistance.

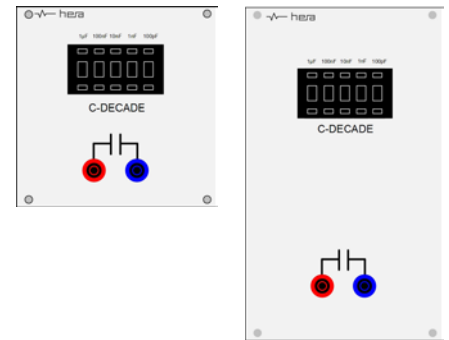
Load Resistor 3 SS.005. A 02	
SS System	A Type
24 3KP	1 0-10Ω / 2,2A
34 0,5EP	2 0-100Ω / 0,7A
37 1MP	3 0-1kΩ / 0,2A
	4 0-10kΩ / 0,1A



KP/EP/MP C-DECADE

- 5x decade switches with precision capacitors 100pF, 1nF, 10nF, 100nF and 1μF.
- Accuracy: 5% + 75pF.
- Max. voltage: 200V AC; max. current: 0,5A.
- 2x 4mm safety jacks to tap the capacities.

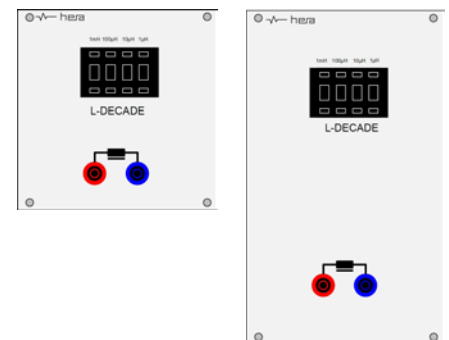
C-Decade	
324.441.202	6KP horizontal (only aluboard)
334.441.202	0,5EP
337.441.202	1MP



KP/EP/MP L-DECADE

- 4x decade switches with precision coils 1μH, 10μH, 100μH and 1mH.
- Max. voltage: 100V.
- 2x 4mm safety jacks to tap the inductance.

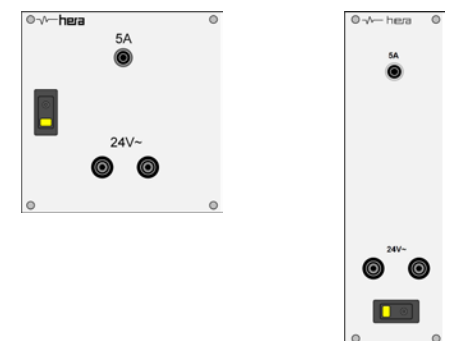
L-Decade	
324.441.302	3KP horizontal
334.441.302	0,5EP
337.441.302	1MP



KP/EP/MP AC LOW VOLTAGE 24V / 5A

- Isolating transformer for the supply of floating 24V AC.
- Output protected by front side operated thermomagnetic fuse.
- Output at 4mm safety jacks.
- Illuminated 2poles switch for central on/ off.

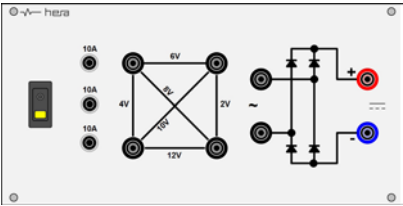
AC Low Voltage 24V / 5A	
928.065.200	4KP horizontal
928.065.252	4KP vertical
334.220.002	0,5EP
337.220.002	0,5MP



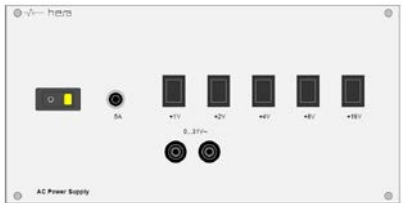
EP/MP AC EXTRA LOW VOLTAGE 1PHASE

- Experimental transformer with four isolated outputs for six floating AC voltages and bridge rectifier for DC voltages.
- Output protected by front side operated thermomagnetic fuses.
- Output at 4mm safety jacks.
- Illuminated 2poles switch for central on/off.

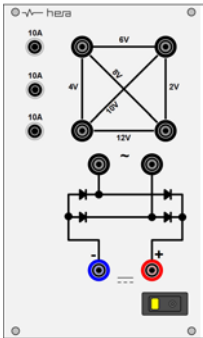
AC Extra Low Voltage 1phase		33 S .221. A 02
S System	A Type	
4 1EP	3	2, 4, 6, 8, 10, 12V / 10A
7 1MP	1	6, 12, 18, 24, 36, 42V / 3A
334.221.200 5 Switches for 0...31V/ 5A in 1V steps (1EP)		



334.221.302



334.221.200 (only AC)

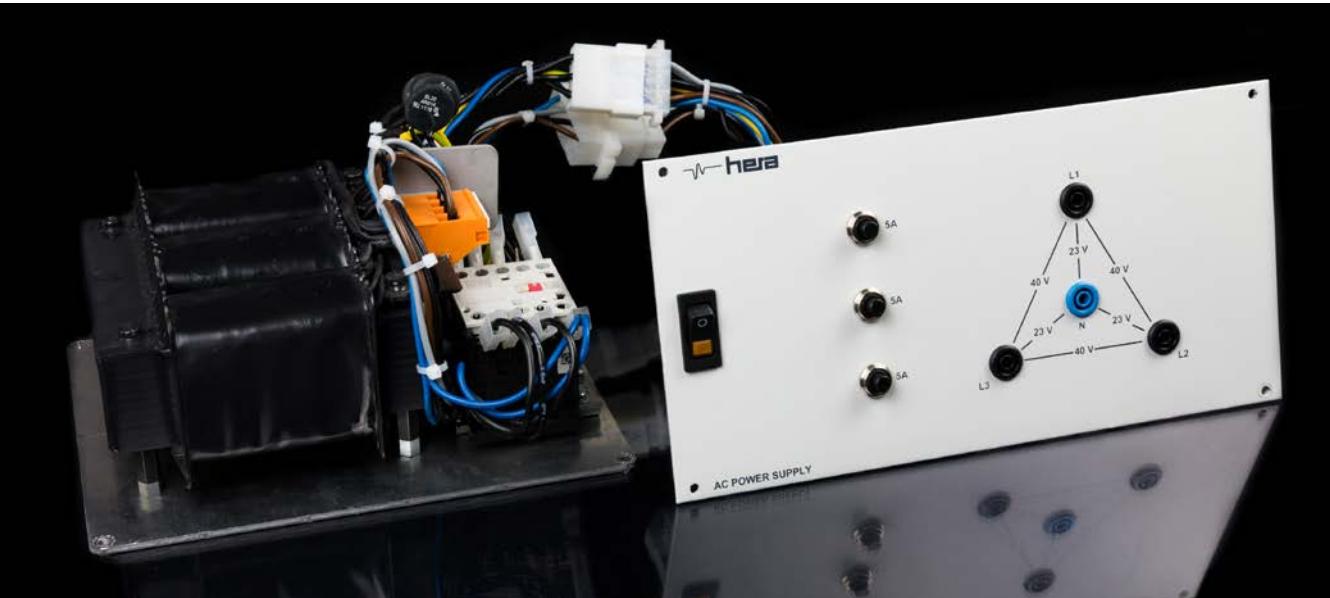
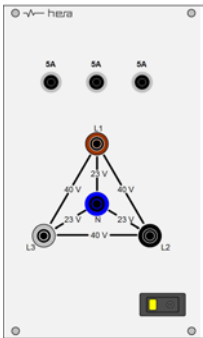
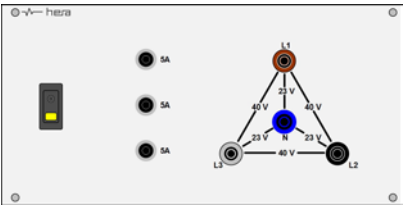


337.221.302

EP/MP AC EXTRA LOW VOLTAGE 3PHASE

- Experimental transformer for isolated 3phase voltage 23V/ 40V.
- Max. phase current: 5A.
- Output protected by front side operated thermomagnetic fuse.
- Output at 4mm safety jacks.
- Illuminated switch with downstream contactor for central on/ off.

AC Extra Low Voltage 3phase	
334.223.002	1EP
337.223.002	1MP



KP/EP/MP MODULE WITH FIXED DC SUPPLY

KP Module with fixed DC Supply 326.1 WW .1 E 2 4KP				
WW Type			E Position	
05	5V / 12A	24	24V / 2,7A	0 horizontal
12	12V / 5,2A	25	24V / 4,2A	5 vertical

EP/MP Module with fixed DC 33 S LLL LLL				
S System	LLL.LLL Type			
3 0,5EP	105.032	5V / 3A	124.012	24V / 1,5A
6 0,5MP	105.052	5V / 5A	124.032	24V / 3,2A
	105.102	5V / 10A	124.062	24V / 6,5A
	112.032	12V / 3A	124.082	24V / 8,4A
	112.062	12V / 6A	148.022	48V / 2,3A
	112.122	12V / 12,5A	148.042	48V / 4,2A

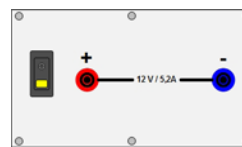
KP Module with fixed DC Supply 326.2 WW .1 E 2 4KP				
WW Type			E Position	
12	+/-12V / 1,0A		0	horizontal
15	+/-15V / 0,8A		5	vertical

EP/MP Module with fixed DC Supply 33 S LLL LLL				
S System	LLL.LLL Type			
3 0,5EP	212.032	+ 12V / 3A + 5V / 6A		
6 0,5MP	224.022	+ 24V / 2A + 5V / 6A		

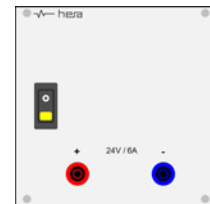
KP Module with fixed DC Supply 326.3 WW .1 E 2 8KP				
WW Type			E Positions	
12	5V / 5A und +/-12V / 1,0A		0	horizontal
15	5V / 5A und +/-15V / 0,8A		5	vertical

EP/MP Module with fixed DC Supply 33 S LLL LLL				
S System	LLL.LLL Type			
3 0,5EP	312.012	+/- 12V / 1A + 5V / 5A		
6 0,5MP	315.012	+/- 15V / 0,8A + 5V / 5A		

- Stabilized and shortcircuit proofed DC power supply, galvanically insulated.
- Overload -, overvoltage - and overtemperature protected.
- Offset: approx. 2%
- Ripple: approx. 120mV p-p.
- Output at 4mm safety jacks.
- Illuminated 2poles switch for central on /off.



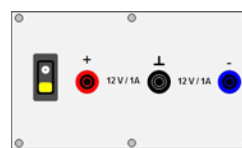
4KP horizontal



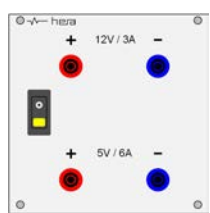
0,5EP



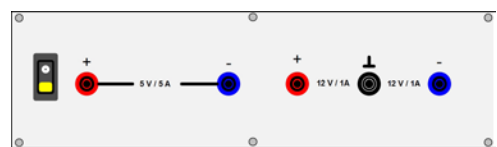
0,5MP



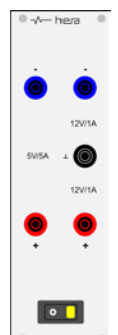
4KP horizontal



0,5EP



8KP horizontal



0,5MP



DC Supply (KP)



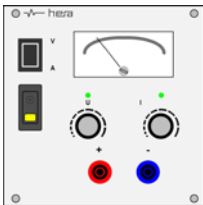
DC Supply (EP)

KP/EP/MP REGULATED DC SUPPLY COMPACT 0...30V / 0...2A

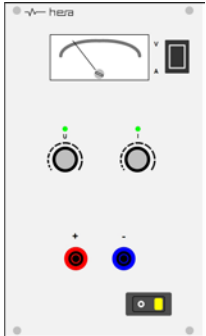
- Linear controlled, earthfree and shortcircuit proofed laboratory power supply.
- Ripple: < 1mV eff.
- Offset: < 0,05%.
- Potentiometer for voltage - and current control and status LED.
- Output on 4mm safety jacks.
- Selector switch for voltage or current reading.
analog: Moving iron class 1,5.
digital: 4digit LED display, accuracy: 0,5% +/- 1digit.
- Illuminated 2poles switch for central on /off.
- With wire harness and couplers.



9KP horizontal

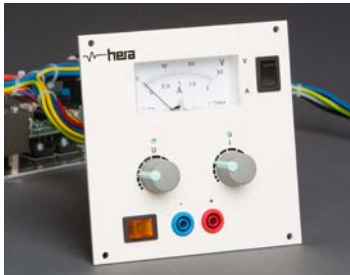


0,5EP



1MP

Regulated DC Supply Compact 0...30V / 0...2A			
326.532.102	analog, horiz. (9KP)	334.810.202	analog (0,5EP)
326.532.502	digital, horiz. (9KP)	334.810.402	digital (0,5EP)
326.532.152	analog, vert. (9KP)	337.810.202	analog (1MP)
326.532.552	digital, vert. (9KP).	337.810.402	digital (1MP)
xxx.xxx.x82	120V Versions		



KP/EP VARIABLE DC SUPPLY 0-35V / 5A

- Programmable control voltage module 250W with 1.44" color OLED display, 4 buttons and rotary knob.
- Coincident voltage - and current indication.
- External function unit (250x120x40mm.)
- Output 0-35V / 0-5A in 10mV / 1mA steps.
- Accuracy: $\pm 0,5\%$ of voltage and current.
- Ripple: < 100mV_{SS}.
- Input: 100 - 264VAC, frequency: 50/60Hz.
- Output at 4mm safety jacks.
- Illuminated 2poles switch for central on/ off.



5KP horizontal



0,5EP



Variable DC Supply 0-35V / 5A	
326.555.002	5KP horizontal
334.555.002	0,5 EP
337.555.002	1 MP

KP/EP/MP ICOM DIDACTIC SUPPLY WITH PC INTERFACE

- Background illuminated graphic LC-display (60x30mm).
- Operated with buttons and rotary switch.
- Front side USB -, rear side LAN interface.

Lab Power Supply 0 - 30V / 0 - 2A

- Short circuit proofed with ripple $<1\text{mV}_{\text{RMS}}$.
- Output with 4mm safety jacks.
- Technical data, see lab power supply LINEAR 60W.

Fixed DC Voltages $\pm 15\text{V}$ $\pm 12\text{V}$ $\pm 5\text{V}/1\text{A}$

- Selector switch for the voltages and status indication.
- Shortcircuit proofed.
- Output with 4mm safety jacks.

Function Generator 0,05Hz - 200kHz

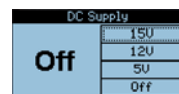
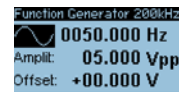
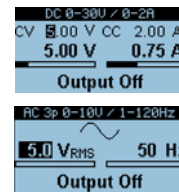
- Waveforms: sinus, triangle, square, trapezium, saw tooth (rise and fall).
- Amplitude: $0 \dots 30\text{V}_{\text{SS}}$.
- Shortcircuit proofed..
- Output 50Ω at BNC socket + 4mm safety jacks.

3phase Generator 1 - 120Hz:

- $0 - 10\text{V}_{\text{eff}}$ (L-N) / $0 - 17,3\text{V}_{\text{eff}}$ (L-L) / 400mA .
- Shortcircuit proofed.
- Frequency: 1 - 120Hz adjustable in 1Hz steps.
- Output with 4mm safety jacks.

AC Voltages, fix:

- $24\text{V}/0,2\text{A} + 10\text{V}/0,2\text{A}$ (mains frequency).
- Protected by self-resetting fuses.
- Output with 4mm safety jacks.



fixed AC Voltage
 $10\text{V}/24\text{V}$, max. $0,2\text{A}$

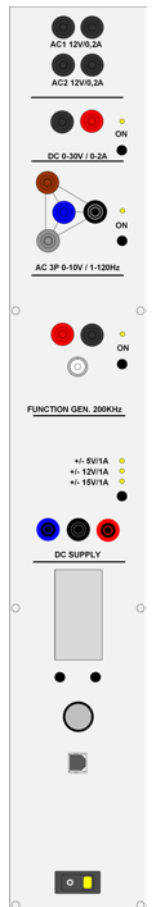
Lab Supply
 $0 - 30\text{V} / 0 - 2\text{A}$

3phase Generator
 $1 - 120\text{Hz}$

Function Generator
 $0,1\text{Hz} - 200\text{kHz}$

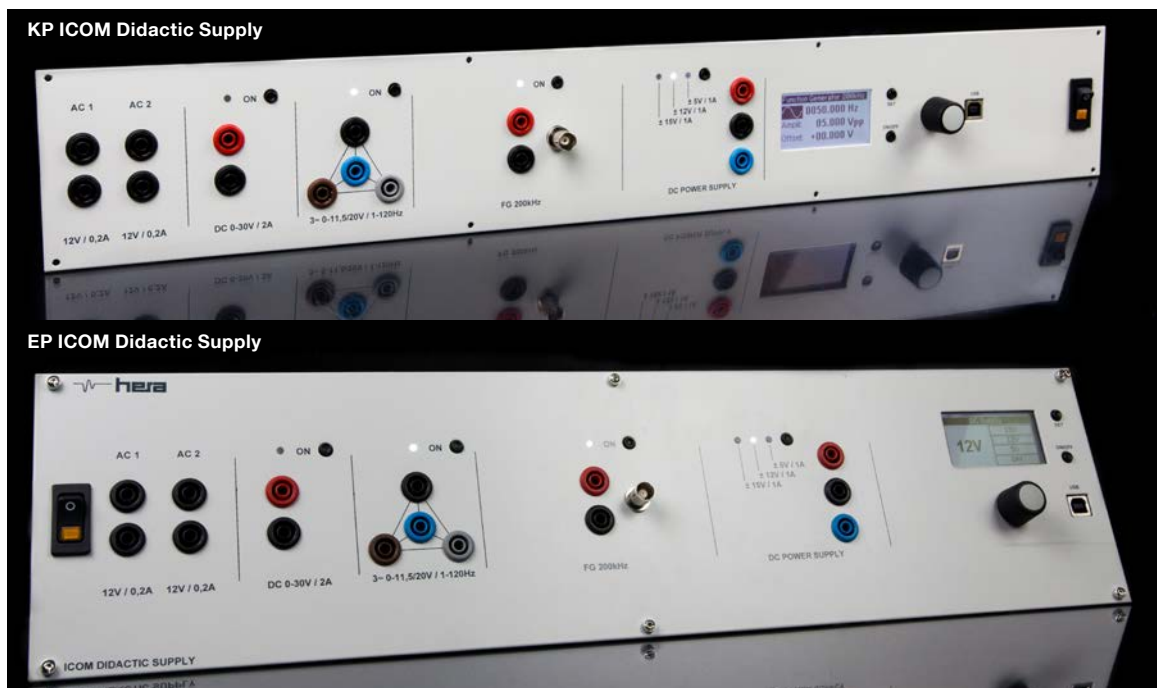
Fixed DC Supply
 $\pm 15\text{V} \pm 12\text{V} \pm 5\text{V}/1\text{A}$

Display and Operation
Panel with USB
Interface



ICOM Didactic Supply

610.800.301	15KP vertical
620.800.301	15KP horizontal
630.800.301	2EP
650.800.301	3MP



PROGRAMMABLE IMOD DEVICES

The intelligent and modular IMOD devices is a series of programmable lab sources, which can be easily integrated in existing networks and which fully communicates by data bus, thus it is fully in accordance with latest IoT standards. The system consists of a modular choice of:

- the Control-Unit for HMI
- selection of Function-Units
- corresponding Connection-Units with In- and Output Jacks and Sockets

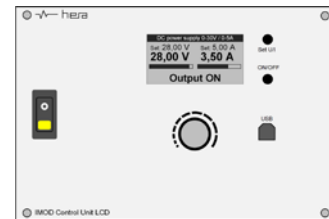
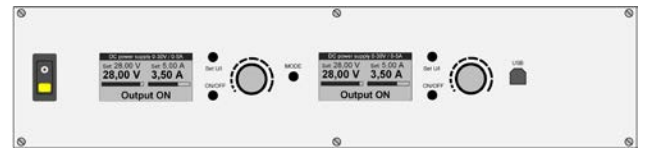
The modular system offers following advantages:

- one Control-Unit TOUCH supporting 5 Function-Units for optimal space saving
- bulky and heavy Function-Units (e.g. variacs) can be placed comfortably under the bench
- Connecting-Units are very small and can even be located in modular equipped ENERGY extensions, which keeps the laboratory cords clearly arranged at the sides of the table
- the Control-Unit can be located in ergonomic reach and view of the operator, which allows to control and to monitor all devices without permanently moving around
- the Control-Unit indicates the actual and nominal values of connected devices at a glance
- integration of more IMOD modules in plug-and-play manner

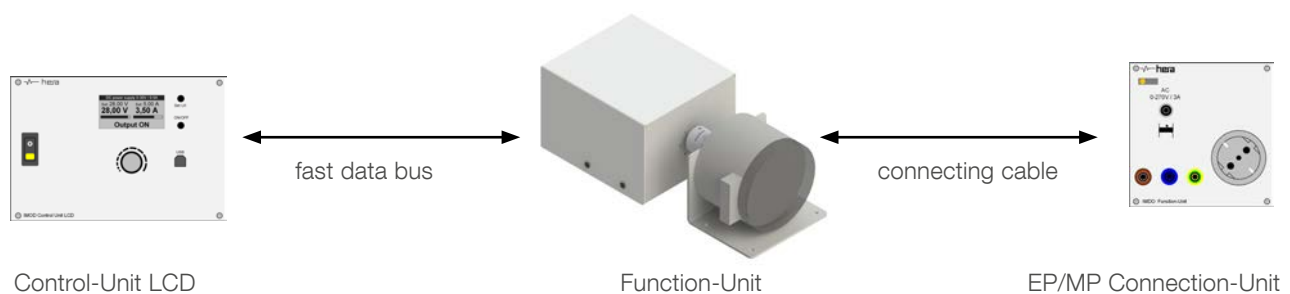
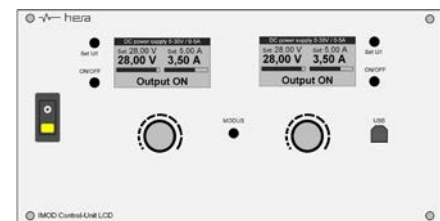


KP/EP/MP IMOD CONTROL-UNIT LCD

- Controller with internal bus for the complete control of a downstream Function-Unit.
- Background illuminated graphic LC-display 60x30mm.
- Rotary switch with pushbutton function for a fast and precise setting.
- Two extra buttons for fast and intuitive operation.
- Incl. front side USB- and rear side LAN interface.
- Illuminated 2poles switch for central on/ off.
- With wire harness and couplers.

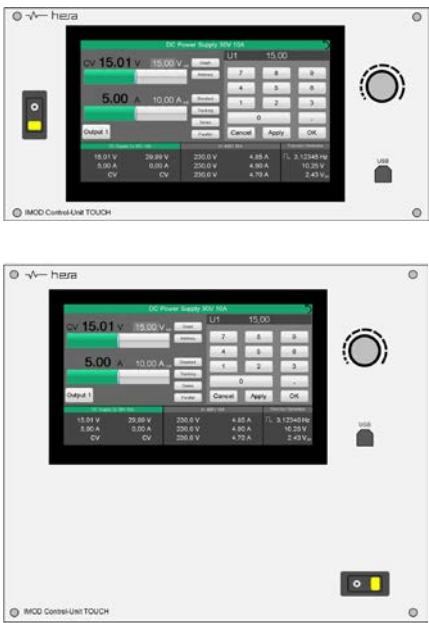


IMOD Control-Unit LCD		6	S	0.000.	A	00
S	System	A	Type			
1	6KP / 10KP vertical	3	1x LC-Display			
2	6KP / 10KP horizontal	5	2x LC-Display			
3	0,75EP / 1EP		(only for double Lab Supplies)			
5	1,5MP / 2MP					



EP/MP IMOD CONTROL-UNIT TOUCH

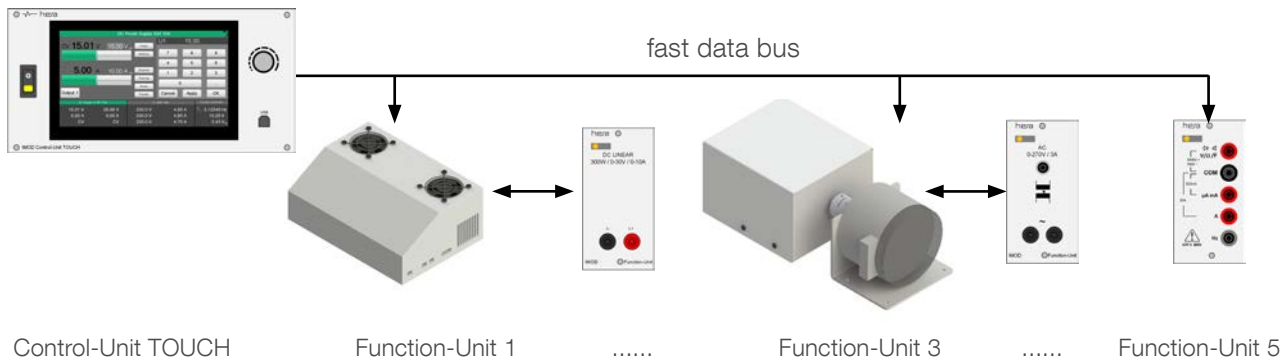
- Controller with internal bus for the central control of max. 5 Function-Units.
- Flush integrated 7" TFT display (800x480) with glass front and wide view angle.
- Highly precise capacitive multitouch screen.
- Rotary switch with pushbutton function for a fast and intuitive control of the most important parameters.
- Settings can be done with touch-slider, touch-keys or rotary switch.
- Value tendency indicated as bargraph, digital in a big numerical display and as graph with data logging function.
- Incl. front side USB - and rear side LAN interface.
- Illuminated 2poles switch for central on/off.
- With wire harness and couplers.



IMOD Control-Unit TOUCH	
630.000.100	IMOD Control-Unit TOUCH 1phase (1EP)
650.000.100	IMOD Control-Unit TOUCH 1phase(2MP)
630.003.100	IMOD Control-Unit TOUCH 3phase (1EP)
650.003.100	IMOD Control-Unit TOUCH 3phase (2MP)
600.001.000	3phase Adapter for IMOD Control-Unit

3phase Adapter for IMOD Control-Unit

- Module with 16A contactor to disconnect all phases incl. N when switching off.
- Required in case of phase distribution or 3phase AC sources.



KP/EP/MP IMOD FUNCTION-UNIT: AC SOURCE 1PHASE

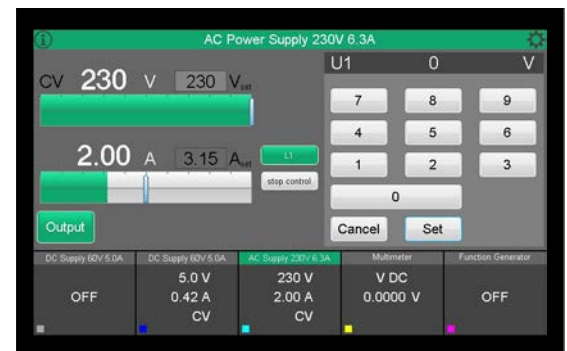
Consisting of KP/EP/MP module for bench rack integration and a completely housed Function-Unit, which can be located with respect to its dimensions in the instrument rack or in an underbench rack.

Connecting-Unit equipped with:

- RGB-LED for status indication.
- Front side operated thermomagnetic output fuse.
- 4mm safety jacks.
- PE-socket or isolated socket for floating voltage.
- 2poles selector switch for floating output.
- Bridge rectifier for a pulsating DC voltage with 48% ripple.

Housed Function-Unit:

- Motor driven variac with isolating transformer (floating type).
- Silent moving actuating motor with intelligent speed control for a minimum of set time and overshoot.
- 2x TrueRMS converter (voltage and current) with 12bit resolution.
- Internal bus for the communication with the Control-Unit.
- Precise voltage - and current settings.
- Set time: max 8s.
- Hysteresis: $\pm U_{\max} / 153$.



IMOD Function-Unit: AC Source 1phase

6 S 2. A LL.LLL

S System A Output

1	KP vertical.	1	AC: Safety Jacks
2	KP horizontal.	2	AC: PE-Socket or Isolated Socket
3	EP	3	AC: Jacks and PE or Isolated
5	MP	4	AC/DC: Jacks and Bridge Rectifier
		5	AC/DC: Jacks, Bridge Rectifier and DC Reading

LL.LLL Type

23.010	0-230V / 1A	03.045	0-30V / 4A floating
23.030	0-230V / 3A	06.035	0-60V / 3A floating
23.060	0-230V / 6A	27.015	0-270V / 1A floating
23.100	0-230V / 10A	27.035	0-270V / 3A floating
23.140	0-230V / 14A	27.055	0-270V / 5A floating
		27.105	0-270V / 10A floating
		27.125	0-270V / 12A floating
		30.105	0-300V / 10A floating
		27.165	0-270V / 16A floating
		30.165	0-300V / 16A floating

Primary L1-L2 3phase supply required!

xxx.xxx.x82

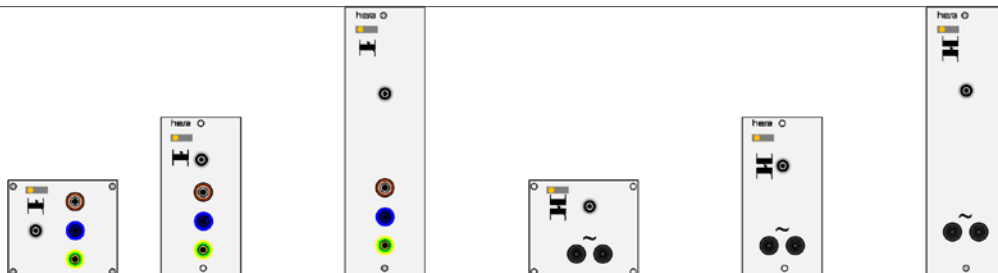
120V Versions

NON Floating

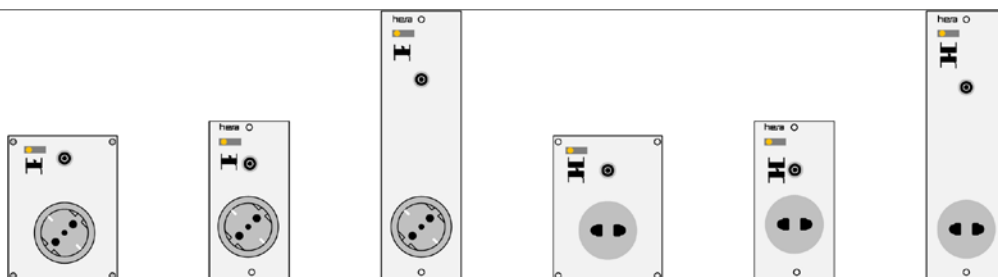
Floating

A Output Type 1:

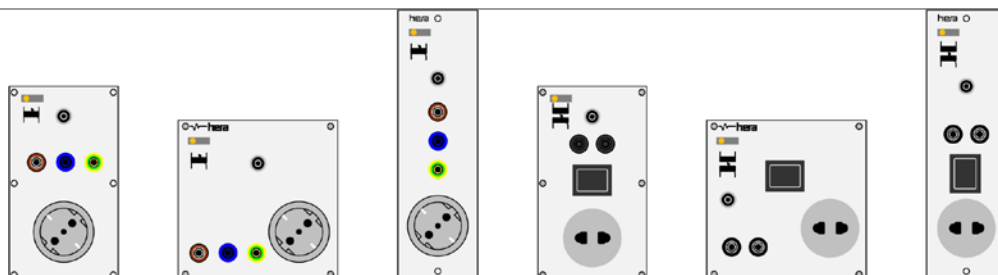
- RGB-LED status indication.
- Front side operated thermomagnetic output fuse.
- 4mm safety jacks.

**A** Output Type 2:

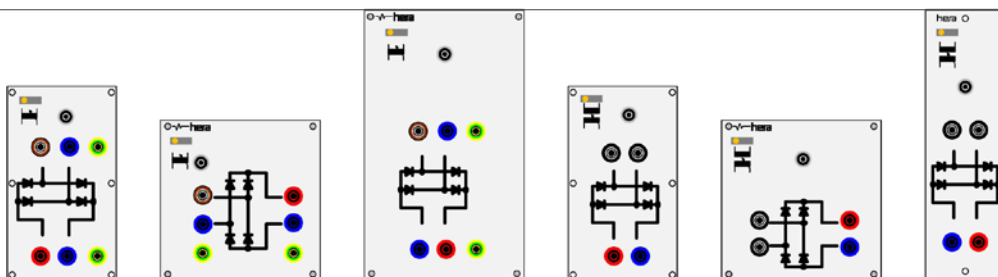
- RGB-LED status indication.
- Front side operated thermomagnetic output fuse.
- PE socket (non-floating), type F or isolated socket (floating). Other socket type on demand!

**A** Output Type 3:

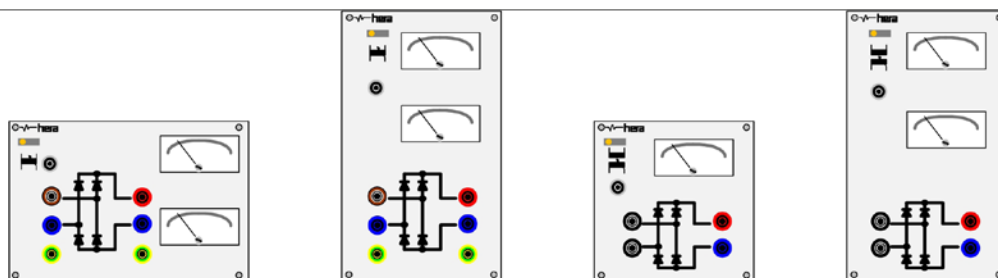
- RGB-LED status indication.
- Front side operated thermomagnetic output fuse.
- Safety jacks.
- PE Socket, type F or isolated socket. Other type on demand!
- 2poles selector switch (floating version).

**A** Output Type 4:

- RGB-LED status indication.
- Front side operated thermomagnetic output fuse.
- Safety jacks.
- DC output with bridge rectifier for a pulsating DC voltage with 48% ripple.

**A** Output Type 5:

- RGB-LED status indication.
- Front side operated thermomagnetic output fuse.
- Safety jacks.
- DC output with bridge rectifier for a pulsating DC voltage with 48% ripple.
- Analogue reading for DC voltage and current (moving iron class 1,5).



KP/EP/MP IMOD FUNCTION-UNIT: AC SOURCE 3PHASE & MEASUREMENT

Consisting of KP/EP/MP module for bench rack integration and a completely housed Function-Unit, which can be located with respect to its dimensions in the instrument rack or under the bench. All Function-Units are with internal bus for communication with the Control-Unit.

Connecting-Unit equipped with (depending on type):

- RGB-LED for status indication.
- Three front side operated thermomagnetic output fuses.
- 4mm safety jacks.
- CEE socket 5poles, red, 400V / 6h.
- 6-point-rectifier for a pulsating DC voltage with 4,3% ripple.
- DC voltage and current reading (moving iron class 1,5).
- 7x 4mm safety jacks arranged as motor terminal (U1, U2, V1, V2, W1, W2 and PE).
- Selector switch for star / delta and rotation field.

Function-Unit AC Source, 3phase:

- Motor-operated 3phase variac with isolating transformer (only floating type).
- Silent moving actuating motor with intelligent speed control for a minimum of set time and overshoot.
- 6x TrueRMS converter (3x voltage and 3x current) with 12bit resolution.
- Precise voltage - and current control.
- Set time: max 8s.
- Hysteresis: $\pm U_{max} / 153$.

Function-Unit Measuring Unit, 3phase:

- 6x TrueRMS converters (3x voltage / 3x current) with 12bit resolution.



Note: only with Control-Unit TOUCH.

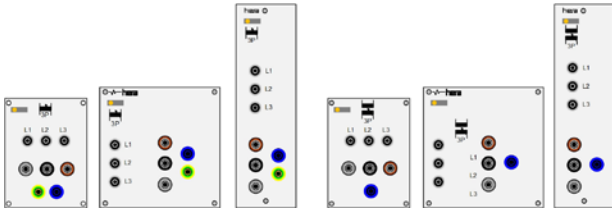


IMOD Function-Unit: AC Source 3phase			6 S 3. A LL.LLL		
S	System	A	Output	LL.LLL	Type
1	KP vertical	1	Safety Jacks	40.010	0-400V / 1A
2	KP horizontal	2	CEE Socket 5poles	40.030	0-400V / 3A
3	EP	3	Jacks and CEE Socket	40.060	0-400V / 6A
5	MP	4	Jacks and Bridge Rectifier	40.100	0-400V / 10A
		5	AC/DC: Jacks and DC Voltage / Current Display	40.140	0-400V / 14A
		6	AC/DC: CEE + Jacks and DC Voltage / Current Display		
		7	Motor Tester: Jacks		
		8	Motor Tester: Jacks and CEE		
				40.015	0-400V / 1A floating
				40.035	0-400V / 3A floating
				45.055	0-450V / 5A floating
				40.105	0-400V / 10A floating
				40.145	0-400V / 14A floating
				52.075	0-520V / 7A floating
				52.105	0-520V / 10A floating

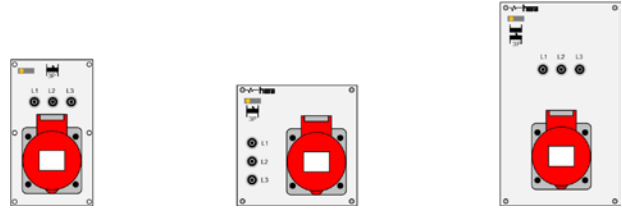
IMOD Function-Unit: Measuring Unit 3phase			6 S 3. A 00.160		
S	System	A	Output	LL.LLL	Type
1	KP vertical	1	AC: Jacks	5	AC/DC: Safety Jacks and DC Voltage / Current Display
2	KP horizontal	2	AC: CEE Socket 5poles	6	AC/DC: CEE + Jacks and DC Voltage / Current Display
3	EP	3	AC: CEE Socket and Jacks	7	Motor Tester: Jacks
5	MP	4	AC/DC: Jacks	8	Motor Tester: Jacks and CEE

A Output Type 1 AC:

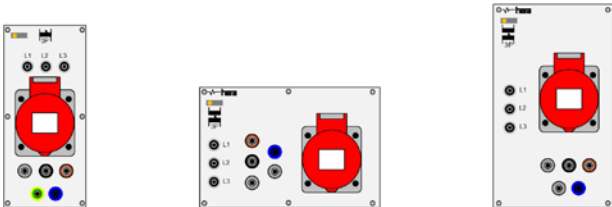
- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- NON floating: 5x safety jacks (L1, L2, L3, N and PE).
- floating: 4x safety jacks (L1, L2, L3 and N).

**A Output Type 2 AC:**

- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- CEE sockets 5poles red 400V / 6h.

**A Output Type 3 AC:**

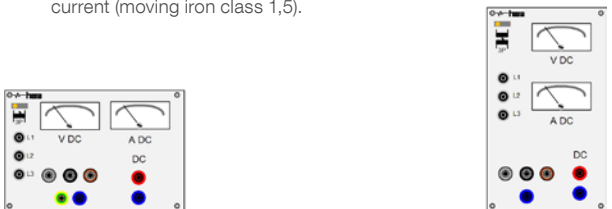
- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- CEE sockets 5poles red 400V / 6h.
- NON floating: 5x safety jacks (L1, L2, L3, N and PE).
- floating: 5x safety jacks (L1, L2, L3, N and equip. bonding).

**A Output Type 4 AC/DC:**

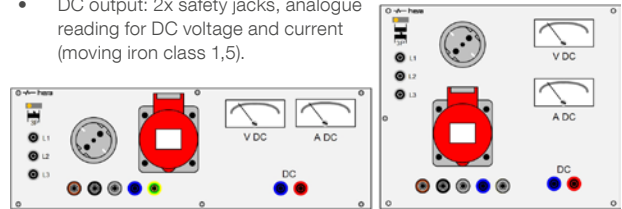
- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- AC outputs: 5x safety jacks (4x floating type).
- 6-point rectifier for pulsating DC voltage (4,3% ripple).
- DC output: 2x safety jacks.

**A Output Type 5 AC/DC:**

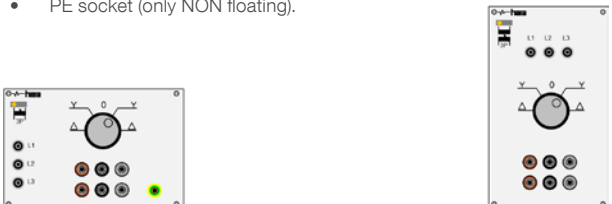
- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- AC outputs: 5x safety jacks (4x floating type).
- 6-point rectifier for pulsating DC voltage (4,3% ripple).
- DC output: 2x safety jacks, analogue reading for DC voltage and current (moving iron class 1,5).

**A Output Type 6 AC/DC:**

- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- AC outputs: 5x safety jacks, PE socket type F (others on demand) and CEE socket,
- 6-point rectifier for a pulsating DC voltage (4,3% ripple).
- DC output: 2x safety jacks, analogue reading for DC voltage and current (moving iron class 1,5).

**A Output Type 7 Motor Tester:**

- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- 6x 4mm safety jacks arranged as motor terminal (U1, U2, V1, V2, W1, W2).
- Selector for star / delta and rotation field.
- PE socket (only NON floating).

**A Output Type 8 Motor Tester:**

- RGB-LED status indication.
- 3x front side operated thermomagnetic output fuses.
- 6x 4mm safety jacks arranged as motor terminal (U1, U2, V1, V2, W1, W2).
- Selector for star / delta and rotation field.
- 5x safety jacks.
- CEE socket.



KP/EP/MP IMOD FUNCTION-UNIT: LAB POWER SUPPLY LINEAR

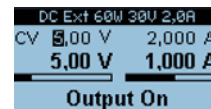
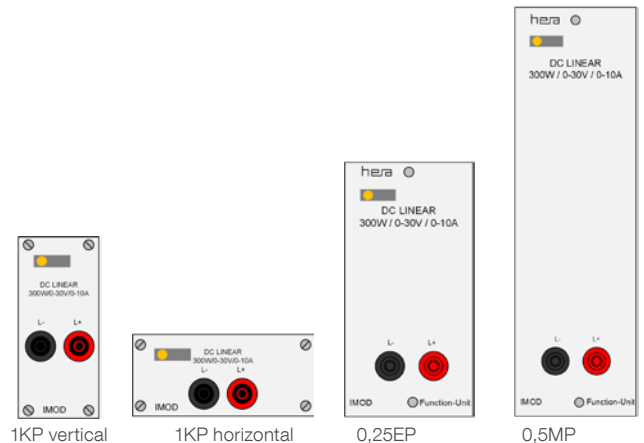
Consisting of KP/EP/MP module for bench rack integration and a completely housed Function-Unit, which can be located with respect to its dimensions in the instrument rack or in an under-bench rack.

Connecting-Unit equipped with:

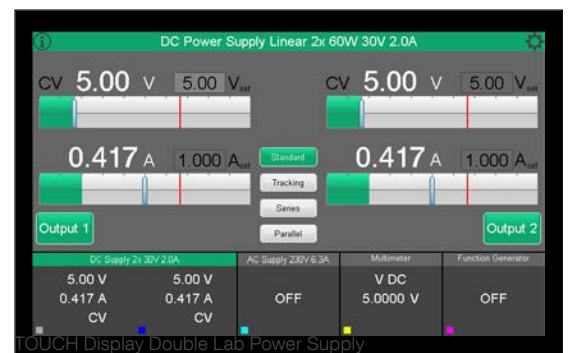
- RGB-LED for status indication.
- 2x 4mm safety jacks.

Housed Function-Unit:

- In-phase controlled lab power supply with transformer switching.
- Silent operating fan with temperature controlled speed for 150W and 300W (60W - fanless).
- Display of measurements: 14 bit (16384 dots).
- Resolution of measurements: 16 bit (65536 dots).
- Ripple (at $I_a = 50\%$): $<0,7\text{mV}_{\text{RMS}}$.
- Set time (load step 10-90% I_a , at 50% U_a): $<120\mu\text{s}$.
- External voltage protection: 100V / 50V (60W).



graphical LCD Display Single



TOUCH Display Double Lab Power Supply



Housed Function-Unit: Lab Power Supply LINEAR 60W

IMOD Function-Unit: Lab Power Supply

6 S 6.10 L.LLL

S System

L.LLL Linear

1	1KP vertical	3.020	60W:	0 - 30V / 0 - 2A
2	1KP horizontal	3.050	150W:	0 - 30V / 0 - 5A
3	0,25EP	3.100	300W:	0 - 30V / 0 - 10A
5	0,5MP	6.050	300W:	0 - 60V / 0 - 5A

KP/EP/MP IMOD FUNCTION-UNIT: LAB POWER SUPPLY EXTENDED RANGE

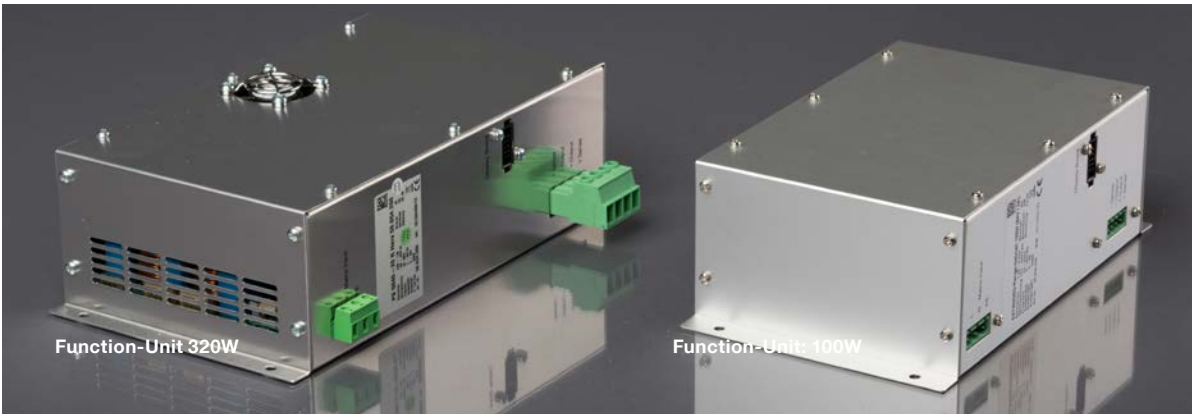
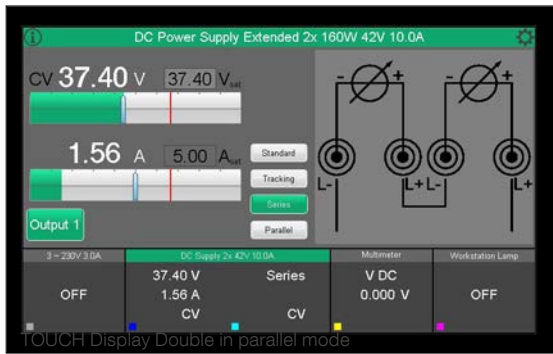
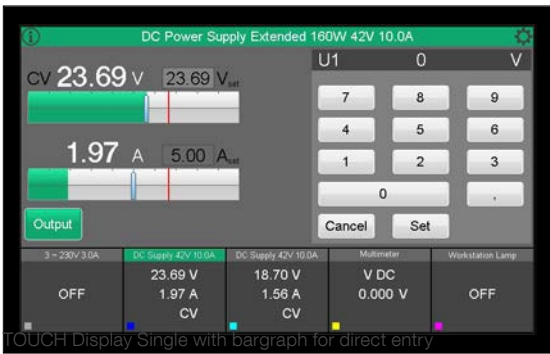
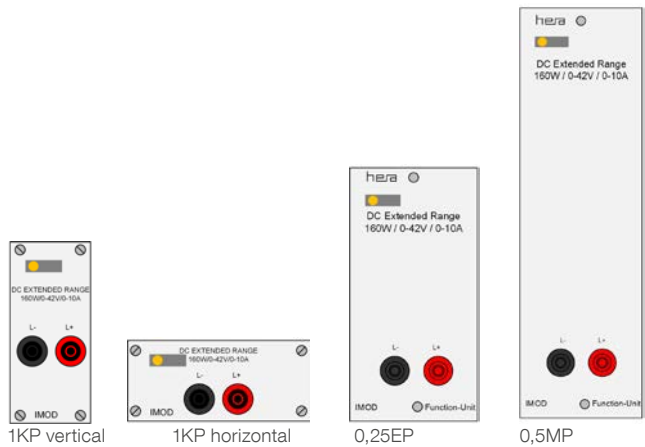
Consisting of KP/EP/MP module for bench rack integration and a completely housed Function-Unit, which can be located with respect its dimensions in the instrument rack or in an underbench rack.

Connecting-Unit equipped with:

- RGB-LED for status indication.
- 2x 4mm safety jacks.

Housed Function-Unit:

- Lab power supply, fanless up to 160W.
- Stability at 0-100% load: <0,8%.
- Stability at 10% mains alternation: <0,02%.
- Ripple: <5mV_{RMS}.
- Set time 10-100% load: <1ms.
- Overvoltage protection: 0...46,2V.
- Accuracy: < 0,2%.
- Nominal values of current and voltage adjust one another so the max. power is not exceeded.



IMOD Function-Unit: Lab Power Supply Extended Range 6 S 5.10 LLL 0					
S System		L.LL	Type		
1	1KP vertical	4.06	100W: 0-42V / 0-6A	8.03	100W: 0-84V / 0-3A
2	1KP horizontal	4.10	160W: 0-42V / 0-10A	8.05	160W: 0-84V / 0-5A
3	0,25EP	4.20	320W: 0-40V / 0-20A		
5	0,5MP				

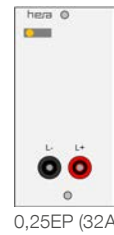
KP/EP/MP IMOD FUNCTION-UNIT: INTERFACE CONNECTION FOR HIGH PERFORMANCE POWER SUPPLY

The system consists of the KP/ EP / MP Connecting-Unit for bench rack integration with interface to a high performance power supply.

The IMOD interface with Connecting-Unit allows to locate the high performance power supply conveniently under the table for keeping the instrument rack quite small. The power supply can be fully controlled at the Control-Unit or software.

Connecting-Unit equipped with:

- Rear sided LAN connection.
- RGB-LED for status indication.
- **max 32A:** 2x 4mm safety jacks wired to power supply max. 32A.
- **max. 80A:** 2x 6/4mm safety jacks + 2x 4mm sense safety jacks wired to the power supply max. 80A.
- **max. 125A:** 2x 6mm safety jacks + 2x 4mm sense safety jacks wired to power supply.



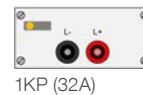
0,25EP (32A)



0,5EP (80A)



0,5MP (125A)



1KP (32A)



3KP (80A)



6/4 Safety Jack
(for 6mm high current
plugs and 4mm lab plugs)

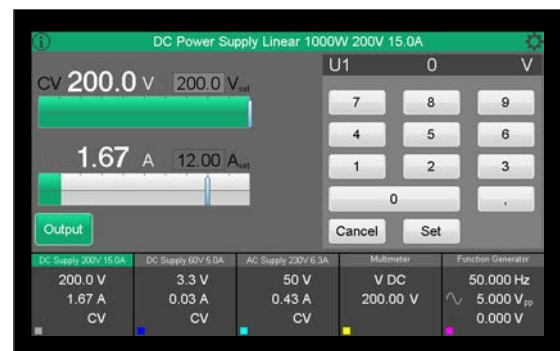


6mm Safety Jack
(for 6mm high current
plug)



299.540.000
2x 6mm plug red /
black)

IMOD Function-Unit: Interface Connection 6 S 5.200. A 00	
S System	A Current
1 1KP (3KP) vertical	5 4mm jacks (max. 32A)
2 1KP (3KP) horizontal	6 6/4mm jacks (max. 80A)
3 0,25EP (0,5EP)	7 6mm jacks (max. 125A)
5 0,5MP (0,5MP)	



19" HIGH PERFORMANCE POWER SUPPLY 2HE

- 19" microcontroller controlled power supply.
- Power controlled output stage (nominal values of voltage and current adjust one another, so the max. power is not exceeded).
- Color TFT display.
- Rear sided USB - and LAN Connection.
- Dimensions: 483 x 89 x 470mm (WxHxD).
- See chapter 11 for technical details.



Power Supply	1000W
365.100.040	0 - 40V / 0 - 40A
365.100.080	0 - 80V / 0 - 40A
365.100.200	0 - 200V / 0 - 15A
365.100.360	0 - 360V / 0 - 10A
365.100.500	0 - 500V / 0 - 6A

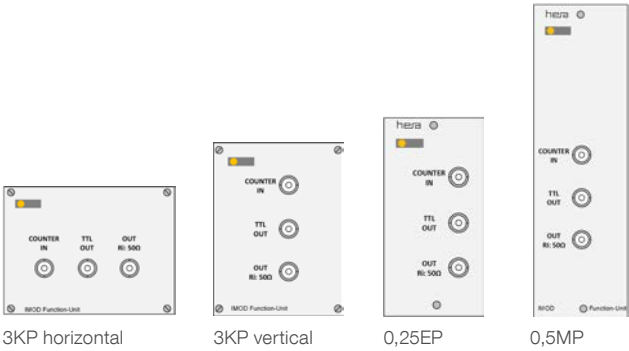
Power Supply	1500W
365.150.040	0 - 40V / 0 - 60A
365.150.080	0 - 80V / 0 - 60A
365.150.200	0 - 200V / 0 - 25A
365.150.360	0 - 360V / 0 - 15A
365.150.500	0 - 500V / 0 - 10A

Power Supply	3000W
365.300.040	0 - 40V / 0 - 120A
365.300.080	0 - 80V / 0 - 120A
365.300.200	0 - 200V / 0 - 50A
365.300.360	0 - 360V / 0 - 30A
365.300.500	0 - 500V / 0 - 20A

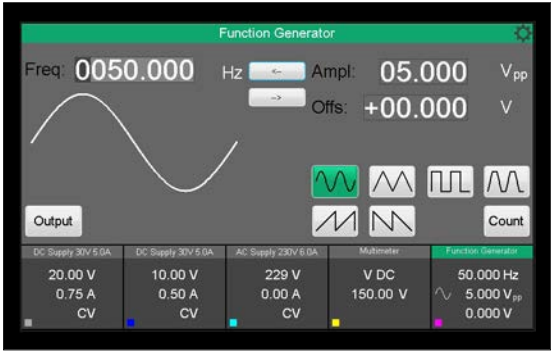
KP/EP/MP IMOD FUNCTION-UNIT: **FUNCTION GENERATOR**

Connecting-Unit with housed Function-Unit:

- RGB-LED for status indication.
- 3x BNC sockets
(COUNTER IN, TTL OUT and OUT Ri: 50Ω).
- Basic functions: sinus, triangle, square , saw tooth, pulse, trapezium.
- Frequency range: 50mHz – 10MHz (sinus), 50mHz – 1MHz (other signals).
- Arbitrary functions according to value table (comfortable handling by IMODdesktop).
- Other functions: PWM, TTL-output.
- Amplitude: 30V_{SS} (max. 1MHz), up to 3V_{SS} at 10MHz.
- Resolution: 12bit.
- Duty cycle: 0,1% ... 99,9%.
- DC Offset: ± 7,5V.
- Frequency measurement: max. 50MHz.



IMOD Function-Unit: Function Generator	
617.000.000	3KP (vertical).
627.000.000	3KP (horizontal).
637.000.000	0,25EP
657.000.000	0,5MP

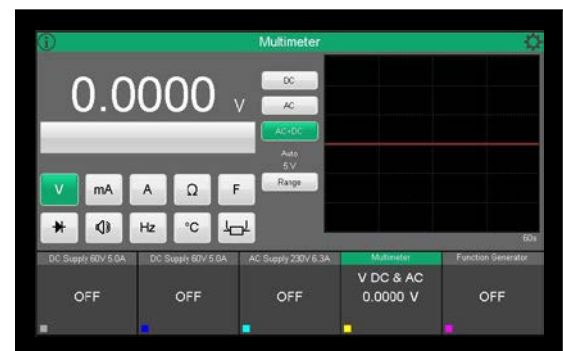
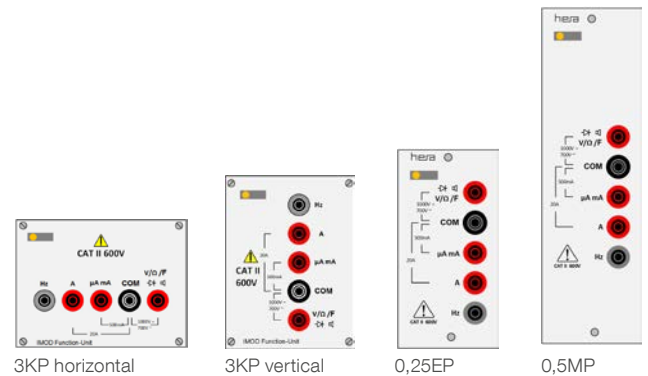


Function-Unit: Function Generator 0,25EP

KP/EP/MP IMOD FUNCTION-UNIT: MULTIMETER

Connecting-Unit with housed Function-Unit:

- RGB-LED for status indication.
- 5x 4mm safety jacks
(Hz, A, μ A/mA, COM, V/ Ω /F/diode/continuity/temperature).
- Resolution: 4 3/4 digit (50.000 counts).
- Voltage DC: 10 μ V – 1000V.
- Voltage AC TrueRMS: 10 μ V – 700V.
- Current DC: 10nA – 20A .
- Current AC TrueRMS: 10nA – 20A.
- Protection of current inputs.
- Resistance: max. 50M Ω .
- Frequency: 100 μ Hz – 50MHz.
- Capacity: max. 5mF.
- Other functions: diode tests, continuity test, temperature measurement and high current measurement via shunt.
- Manual or autoranging.
- CAT II 600V.



IMOD Function-Unit: Multimeter	
614.000.000	3KP vertical.
624.000.000	3KP horizontal.
634.000.000	0,25EP
654.000.000	0,5MP
604.000.100	Immersion Temperature Sensor
604.000.200	Surface Temperature Sensor
604.000.300	Kapton Tape Temperature Sensor



604.000.100:

Immersion Temperature Sensor -70 ... +250°C

- Water resistant immersion sensor 3mm diameter
- Silicon handle and highly flexible silicon cable
- Pt1000 class B
- 1m cable with 4mm lab plug



604.000.200:

Surface Temperature Sensor -190 ... +260°C

- Surface sensor with fixation hole
- Pt1000 class A
- Stainless steel sleeve 40mm, hole 4,5mm
- 2m cable with 4mm lab plug



604.000.300:

Kapton Tape Temperature Sensor -190 ... +260°C

- fast reacting contact sensor. As the sensor is integrated in transparent kapton foil, it is perfectly suitable for different surfaces and e.g. underlaying positions.
- Pt100 class B kapton tape sensor
- Thickness approx. 1,4mm
- 2m cable with 4mm lab plug

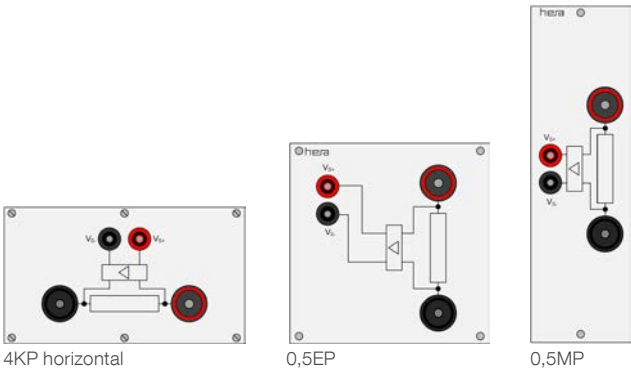


KP/EP/MP IMOD FUNCTION-UNIT: HIGH CURRENT MEASUREMENT

The Function-Unit for high-current measurement is an addition to the IMOD Function-Unit Multimeter. The module holds a high-current shunt with amplifier. The IMOD Control-Unit automatically calculates and indicates the measured current basing on the preset divider value.

Connecting-Unit equipped with:

- Housed and isolated high current shunt with 2x 6/4mm high current safety jacks.
- Measuring amplifier with output on 4mm safety jacks for connection to the voltage input of the IMOD multimeter.
- Accuracy of shunt: class 0,5.



IMOD Funct.-Unit: High Current Measurement 6 S 4.10 M.M 00			
S	System	M.M	Type
1	4KP vertical	0.5	max. 50A with 6/4mm sockets
2	4KP horizontal	1.0	max. 100A with 6mm sockets
3	0,5EP		
5	0,5MP		



SET OF IMOD MEASURING CABLES

Multimeter:

- 2x Safety Test Leads, 100cm
- 2x Test Probes

Lab Power Supply:

- 2x Safety Test Leads, 150cm
- 2x Safety Test Leads, 25cm
- 2x Crocodile Clips

AC Source:

- 5x Safety Test Leads, 100cm
- 4x Crocodile Clips

Function Generator:

- 1x BNC Cables, 100cm
- 1x Adapter BNC - 4mm Lab Jack
- 1x USB Cable



KP/EP/MP IMOD FUNCTION-UNIT: DIDACTIC SUPPLY

Consisting of a KP/EP/MP Connecting-Unit and a individually housed functional unit:

Fixed DC Voltages $\pm 15V$ $\pm 12V$ $\pm 5V/1A$

- Selector switch for the voltages and status indication.
- Shortcircuit proofed.
- Output with 4mm safety jacks.

Function Generator 0,05Hz - 200kHz

- Waveforms: sinus, triangle, square, trapezium, saw tooth (rise and fall).
- Amplitude: 0...30V_{SS}.
- Shortcircuit proofed..
- Output 50Ω at BNC socket + 4mm safety jacks.

3phase Generator 1 - 120Hz:

- 0 – 10V_{eff} (L-N) / 0 - 17,3V_{eff} (L-L) / 400mA.
- Shortcircuit proofed.
- Frequency: 1 - 120Hz adjustable in 1Hz steps.
- Output with 4mm safety jacks.

3phase Generator
1 - 120 Hz

Function Generator
0,1 Hz - 200 kHz

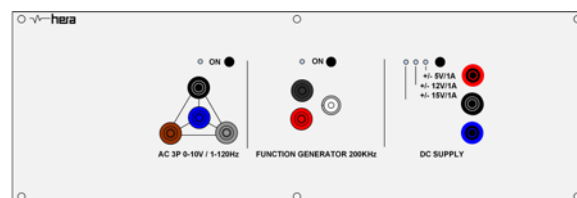
Fixed DC Voltage
 $\pm 15V$ $\pm 12V$ $\pm 5V/1A$



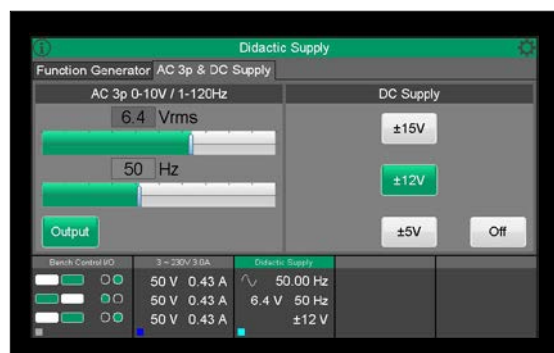
8KP vertical

IMOD Function-Unit: Didactic Supply

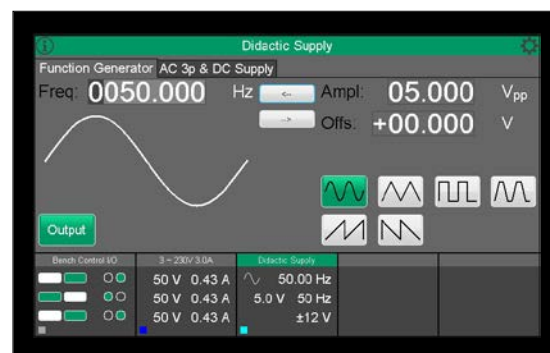
610.800.000	8KP vertical
620.800.000	8KP horizontal
630.800.000	1,5EP
650.800.000	3MP



1,5EP



3phase Generator 1 - 120 Hz and Fixed DC Supply $\pm 15V$ $\pm 12V$ $\pm 5V/1A$



Function Generator 0,1 Hz - 200 kHz

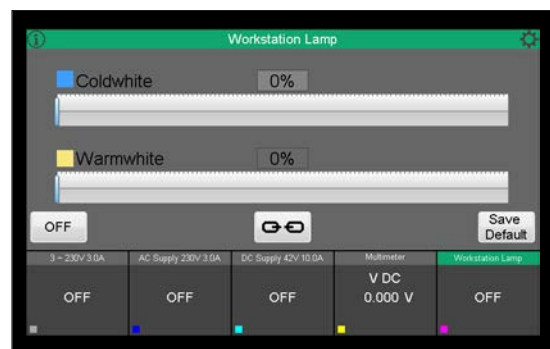
IMOD FUNCTION-UNIT: PROFI LED WORKSTATION LAMP

IMOD integration for LED Workstation Lamp ST and PR with following functions:

- On / Off.
- Dimming: 0 - 100%.
- Color temperature: 2700 - 5500K (only PR).
- Status memory.



see catalogue chapter 3 for article Nos.



INNOVATIVE & NETWORK-OPERATED ROOM CONCEPT

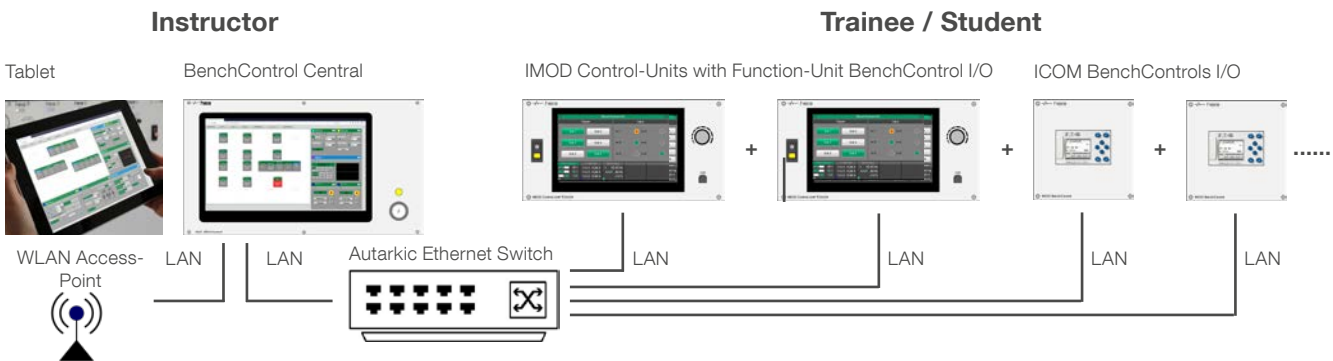
Innovative and flexible classroom concept, where all trainee benches are integrated in an ethernet networks and thus can be completely observed and operated centrally via hera BenchControl Central.

The BenchControl Concept includes:

- Instructor Bench: IMOD BenchControl Central as central control unit.
- Trainee Benches: ICOM BenchControl I/O or/and IMOD BenchControl I/O.
- Remote Software: IMODdesktop as browserclient networks-operated software.

Benefits of the BenchControl Concept:

- Self sufficient (no PC required) central control for highest reliability.
- Economical, modular and flexible networks topology.
- Network-operated webserver solution for OS-independent utilization.
- Use of extra tablets for controlling the room is possible.

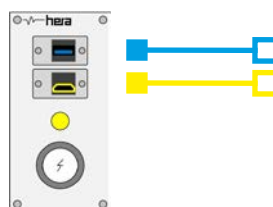


EP/MP MODULE IMOD BENCHCONTROL CENTRAL

Self-sufficient (no PC required!) central control for remote operation and observation of all connected IMOD BenchControls I/O or ICOM BenchControls I/O.

- Powerful and fanless single-board computer with high resolution HDMI interface and fast LAN interface.
- EP Module: flush integrated 4,3" TFT display (800x480) with glass front and wide view angle.
- MP Module: flush integrated 11,6" TFT display (1920x1080) with glass front and wide view angle.
- High precision capacitive multitouch operation.
- Webbrowser basing control software, either for the compact display of all switching modes (IMODmobile) or with individually designed desktop presentation (IMODdesktop).
- Key-switch for central on / off and indicator lamp.

IMOD BenchControl Central	
630.100.100	4,3" TFT display (0,75EP)
650.100.100	11,6" TFT display (3MP)



IMOD FUNCTION-UNIT: **BENCHCONTROL I/O**

Integrated I/O module for the operation and observation of the complete workstation with following functions:

- 6x freely editable relay outputs for various applications:
 - Activation in steps (low -/ mains voltage)
 - Up and down for retractable instrument racks
 - Activation of soldering station and soldering fume extraction
 - Activation and control for selective poles (e.g. voltage provision from instructor bench)
 - Activation of electric lock for container.
- 5x freely editable digital inputs for various applications:
 - Status report for emergency stop
 - Key - or RFID activation
 - Status query for contactors and position switches.
- The outputs are connected to the IMOD Function-Units (DC power supplies, AC sources, ...) for enabling and limit settings via BenchControl I/O.



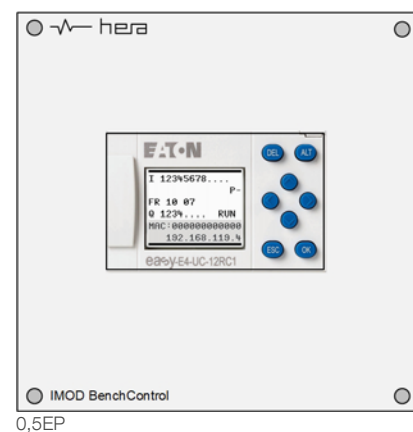
IMOD Function-Unit: BenchControl I/O

601.000.000

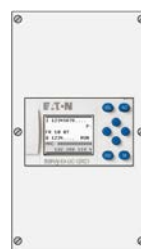
KP/EP/MP **ICOM BENCHCONTROL I/O**

In trainee benches integrated compact controller, which is connected by LAN to a BenchControl Central and allows to switch the connected outputs.

- 4x relay outputs, flexibly assigned e.g. for activation in levels (low - / mains voltage), up / down of retractable instrument racks, on / off for soldering fume extraction or soldering station, etc.
- 8x digital inputs, flexibly assigned e.g. for key - or RFID activation, emergency stop status report.
- LCD with color changing options (white, green, red). Text messages for operating modes, addresses, function keys.
- Timer for time-controlled switching off.
- 4x programmable buttons (can be completely deactivated).
- Ethernet-Interface for the Connection to BenchControl Central.



0,5EP



4KP vertical



1MP

ICOM BenchControl I/O

621.100.000	ICOM BenchControl I/O (4KP) vertical
631.100.000	ICOM BenchControl I/O (0,5EP)
651.100.000	ICOM BenchControl I/O (1MP)

IMODdesktop

Software for IMOD Device Series

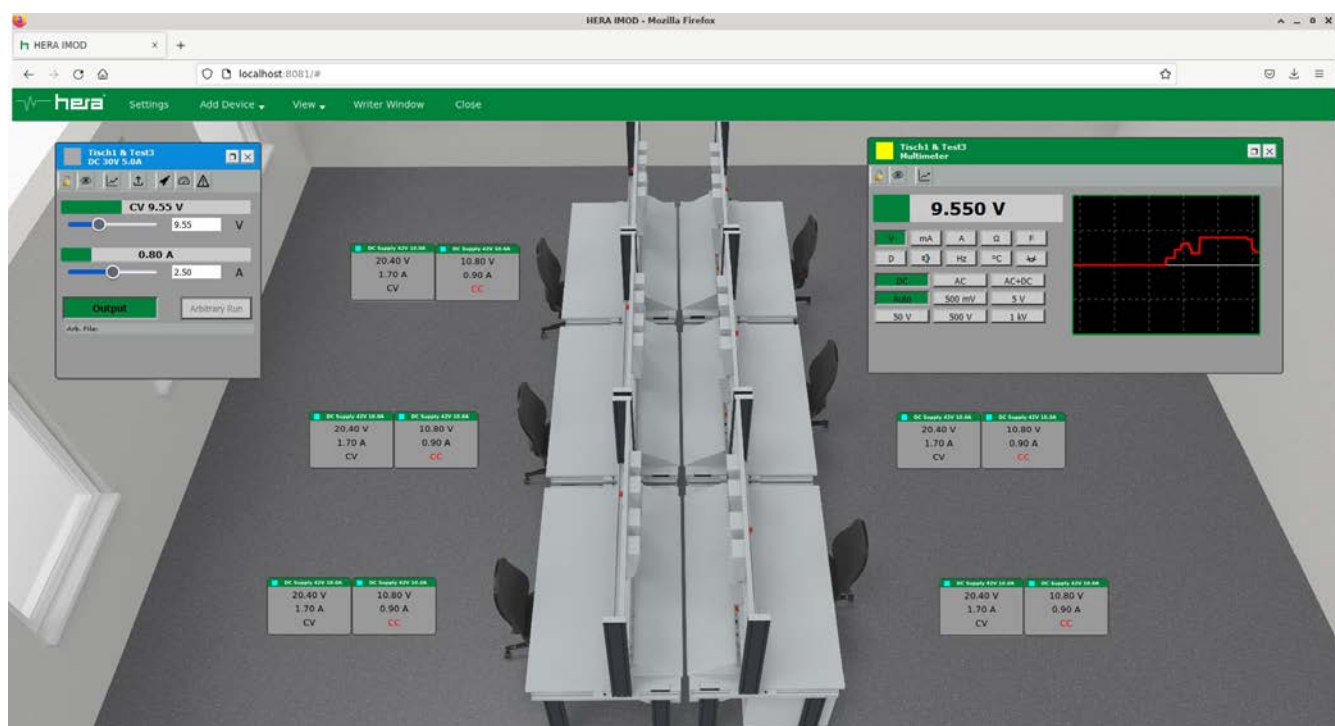
- Applicable as web server solution for the complete class-room or as single license for individual benches.
- Browser client software for OS-independency, thus the software can be used on all devices (PC, notebook, tablet and smart phone).
- Graphical user interface in the same design and operating concept as IMOD Control-Unit TOUCH.
- Dimensions and background freely designable e.g. with classroom plan.
- Easy and intuitive handling (self-explaining).
- Variable arrangement of more IMOD Control-Units as graphical user interface, this allows a clear or even personalized presentation (e.g. student names).
- Grouping of more Function-Units.
- Memory for various arrangements.
- Personalized password protection with individual profiles.
- Comfortable installation software.



Tablet with IMODdesktop



IMODdesktop via LAN networks or directly via USB



Room Control Software IMODdesktop

Available Function-Units:

- BenchControl I/O.
- Variable AC Sources 1- and 3phase and measurement.
- Laboratory Power Supplies, single and double.
- LAN-Connection for High Performance DC Supplies.
- Multimeter (optional high current measurement).
- Function Generator.
- LED Workstation Lamp.

Dialogue Functions:

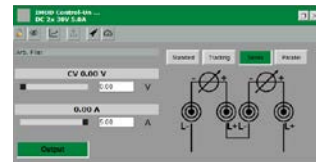
- Display of nominal values in digital numbers and analog bargraph.
- Value setting via slider or keypad.
- Switchable modes and outputs.
- Value setting for start and limit.
- Selection between four activation modes.
- Recording function for all actual values.
- Arbitrary generator for nominal value setting (matrix).

Recorder Function:

- Simultaneous measurement and presentation of more Function-Units, so they can be evaluated within the same time stamp.
- Settings for measured value calculation (min., max., average and last value).
- Selectable time base for long-term measurements.
- Data logging and further-processing as CSV table.

Activation Modes:

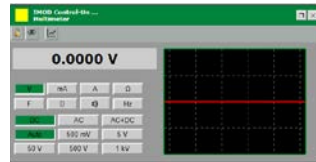
- All control features of the IMOD Control-Unit and software IMODdesktop and IMODmobile.
- Value setting with IMODdesktop. The IMOD Control-Unit can be operated within the preset limit (current and voltage for AC - and DC sources).
- Deactivation of control functions by IMODdesktop. The Control-Unit only serves as display but settings are not enabled.
- Blinding-out the display with IMODdesktop. The display of the Control-Unit is blinded-out and the Control-Unit cannot be operated.



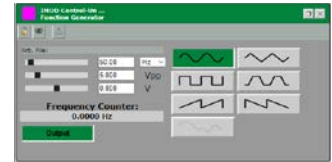
User Interface Double Lab Power Supply



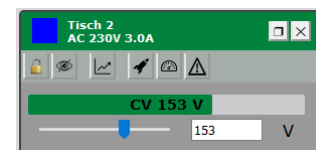
User Interface AC Source 3phase



User Interface Multimeter

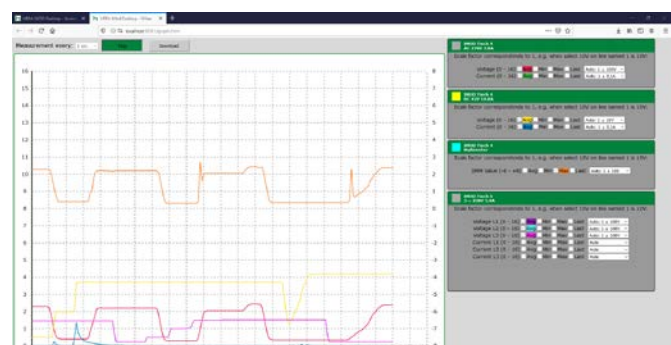
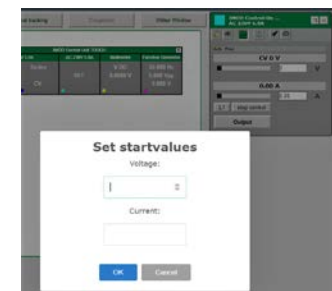


User Interface Function Generator

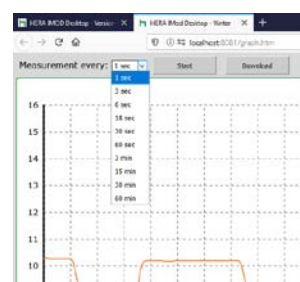
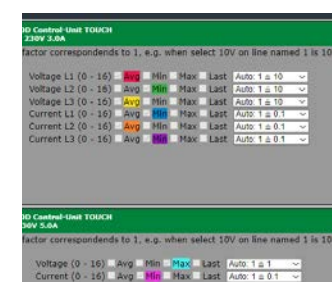


Function-Unit Buttons:

- control deactivated
- reading blinded-out
- recorder activated
- load arbitrary generator
- set start values
- set limit values
- set warning values



Multichannel Chart Recorder

Recorder Time Base:
adjustable time base and download of CSV tableRecorder Measuring Values:
adjustable color and calculating mode for each measuring range.

Software IMODdesktop and IMODmobile

600.000.100	Single License	(for max. 2 Control-Units)
600.000.200	Classroom License	(for n Control-Units)

FIRST-CLASS LAB POWER SUPPLIES FOR VARIOUS APPLICATIONS

hera Lab Power Supplies are characterized by:

- Intuitive control via potentiometer and buttons
- Background-illuminated graphic display indicates all relevant values at a glance
- USB- and LAN-Interface for remote operation
- Incl. operating software with arbitrary function, operation lock and programmable overvoltage protection

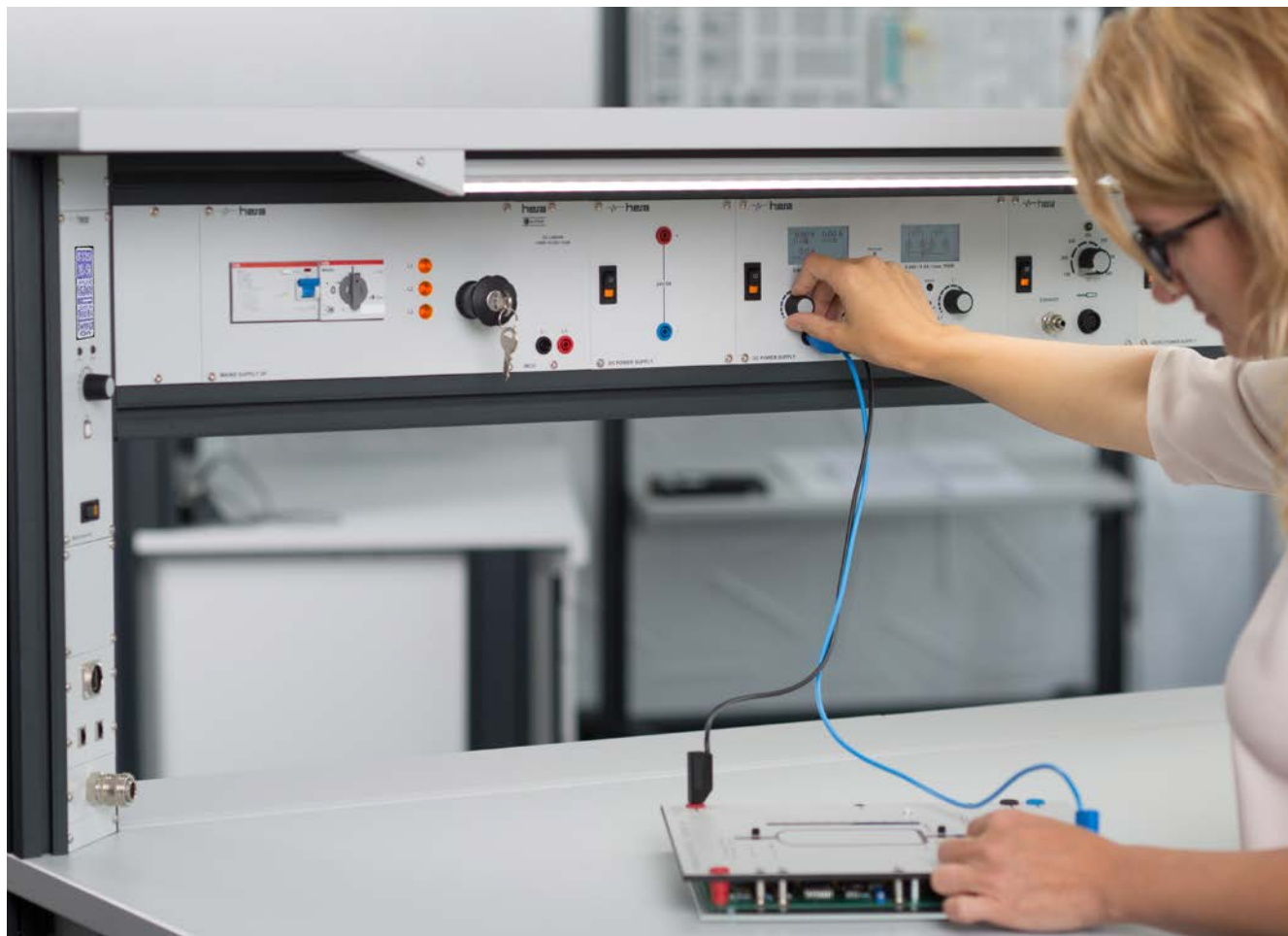
Choose your ideal laboratory power supply from two categories:

Lab Power Supply LINEAR:

- Highly precise, linear controlled power supply with $< 0,7\text{mV}$ ripple
- Power range between 60 - 300W

Lab Power Supply EXTENDED RANGE:

- Powerful switchmode DC supply with $< 5\text{mV}$ ripple
- Extended voltage - and current range without exceeding maximum power



10

11

12

13

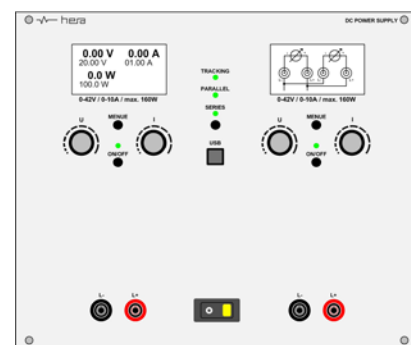
EP/ MP DC POWER SUPPLY

- Background illuminated LCD 60x30mm (128x64) for the indication of all important values and modes at a glance.
- Rotary switch with pushbutton function for the precise setting of current and voltage.
- Buttons for fast and intuitive operation.
- Output ON-/ OFF button with status indication in the display.
- Double power supplies with easy selection between 2-channel -, tracking -, serial - or parallel operation.
- Output at 4mm safety jacks.
- Illuminated 2poles switch for central on / off.
- Front side USB - and rear side LAN interface.



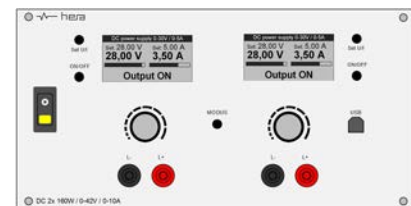
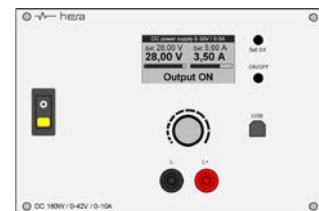
Technical Data Lab Power Supply Extended Range:

- Switchmode lab power supply, up to 160W fanless.
- Stability at 0-100% load: <0,8%.
- Stability at 10% mains alternation: <0,02%.
- Ripple: <5mVrms.
- Set time 10-100% load: <1ms.
- Overvoltage protection: 0...46,2V.
- Accuracy: <0,2%.
- Nominal values of current and voltage adjust one another so the max. power is not exceeded.



Technical Data Lab Power Supply LINEAR:

- In-phase controlled laboratory power supply with transformer switching.
- Silent operating fan with temperature controlled speed at 150W and 300W (60W-fanless).
- Display of measurements: 14bit (16384 dots).
- Resolution of measurements: 16bit (65536 dots).
- Ripple (at $I_a = 50\%$): <0,7mV_{RMS}.
- Set time (load step 10-90% I_a , at 50% U_a): <120μs.
- External voltage protection: 100V / 50V (60W).



Lab Power Supply Extended Range

33 S LLL A 0 V

S System	LLL Type	A Channel	V Interface
4 EP	406 100W / 0 - 42V / 0 - 6A	7 Single	0,75EP / 1,5MP
7 MP	410 160W / 0 - 42V / 0 - 10A	8 Double	1EP / 2MP
	420 320W / 0 - 40V / 0 - 20A		
	803 100W / 0 - 84V / 0 - 3A		
	805 160W / 0 - 84V / 0 - 5A		

Lab Power Supply ICOM LINEAR

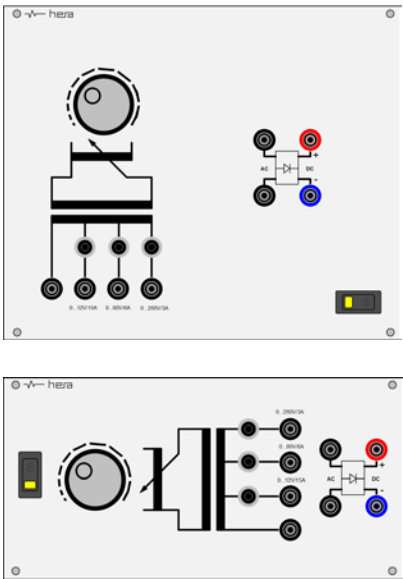
33 S LLL A 03

S System	LLL Type	A Channel
4 EP	302 0 - 30V / 0 - 2A	310 0 - 30V / 0 - 10A
7 MP	305 0 - 30V / 0 - 5A	605 0 - 60V / 0 - 5A

EP/MP AC / DC SOURCE 0 ... 260V/ 3A WITH
DIVIDER TRANSFORMER

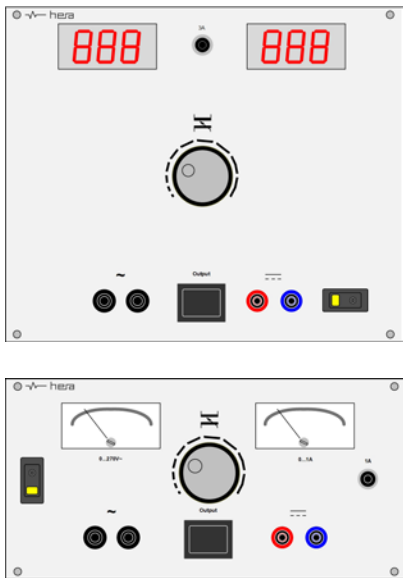
- Variac with downstream isolating transformer for 0...260V/ 3A, 0...60V/ 6A and 0...12V/ 15A.
- Each range protected by front side operated thermomagnetic fuse.
- Output at 4mm safety jacks.
- Bridge rectifier for a pulsating DC voltage with 48% ripple.
- Illuminated 2poles switch for central on / off.

AC / DC Source 0...260V / 3A with Divider Transformer	
334.221.402	1EP
337.221.402	2MP



EP/MP VARIABLE AC / DC SOURCE

- Variac with downstream isolating transformer for floating voltage of 0 ... 100%.
- Bridge rectifier for a pulsating DC voltage with 48% ripple.
- AC - and DC output at 4mm safety jacks.
- Current - and voltage reading.
analog: moving iron instrument, class 1,5.
digital: 3digit LED display TrueRMS (< 0,5% +/- 1 digit).
- Protected by front side operated thermomagnetic fuse.
- Illuminated 2poles switch for central on / off.



Variable AC / DC Source 33 S LLL A 02			
S System	LLL Type	A Reading	
4 EP	039 0 – 30V / 10A 1EP / 2MP	275 0 – 270V / 5A 2MP	3 analog
7 MP	054 0 – 50V / 5A 1EP / 2MP	274 0 – 270V / 1A + 0 - 60V / 4A 1,5EP / 2MP	4 digital
	271 0 – 270V / 1A 1EP / 2MP	279 0 – 270V / 3A + 0 - 60V / 10A 2EP / 2MP	
	273 0 – 270V / 3A 1,5EP / 2MP		

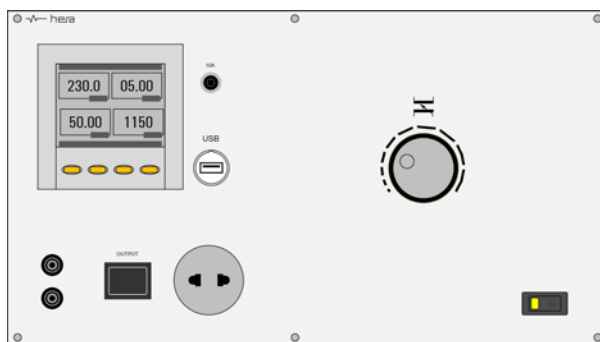
334.279.302: Variable AC/DC Source 0 – 270V / 3A + 0 - 60V / 10A

334.221.402: Variable AC Source 0-260V/ 3A

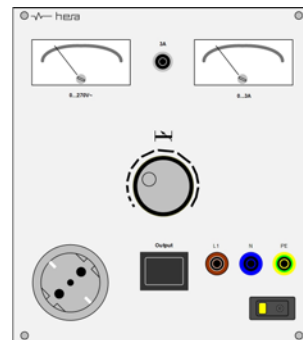
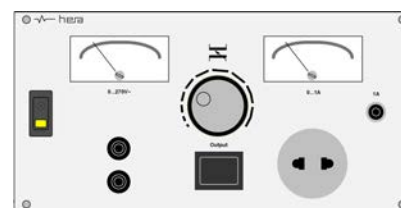
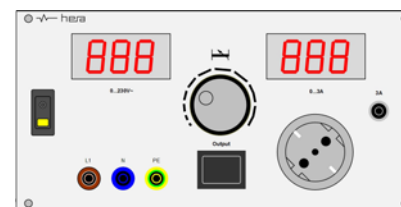
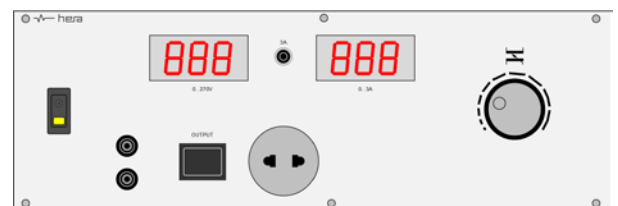


EP/MP VARIABLE AC SOURCE, 1PHASE

- Variac for adjustable output voltage 0...100%.
- Floating version with downstream isolating transformer.
- Protected by front side operated thermomagnetic fuse.
- Selector switch for output at 4mm safety jacks and universal socket (Type F / Franco-American) or PE socket, Type F (other type on demand!).
- Analog: moving iron instrument for current and voltage, class 1,5.
- Digital: LED display for voltage and current TrueRMS (3digit, < 0,5% +/- 1 digit).
- MFD: multifunctional display with graphic LCD with four variably programmable readings and four buttons.
- MFD with front sided USB interface and rear sided LAN interface (technical data page 327).
- Illuminated 2poles switch for central on / off.



Variable AC Source, floating with MFD and USB Interface (3MP)

Variable AC Source
non floating (1,5MP)Variable AC Source
floating (1EP)Variable AC Source
non floating (1EP)

Variable AC Source, floating (1,5EP)

Variable AC Source, 1phase 33 S LLL A 12

S System	LLL Type	A Reading
4 EP	floating	1 analog
7 MP	non-floating	5 digital
	063 0 – 60V / 3A 1EP / 1,5MP	6 MFD (min. 0-270V/5A)
	271 0 – 270V / 1A 1EP / 2MP	7 MFD with USB
	273 0 – 270V / 3A 1,5EP / 2MP	8 MFD with LAN
	275 0 – 270V / 5A 2MP / 3MP (MFD)	
	239 0 – 230V / 10A 3MP	
	279 0 – 270V / 10A 4MP	



EP/MP VARIABLE AC/DC SOURCE 3PHASE

- 3phase variac non-floating with inrush current limiter.
- Protected by front side operated thermomagnetic fuses.
- Output at 4mm safety jacks.
- Output at CEE sockets (not for devices with analog or digital displays).
- AC/DC sources with 6-point rectifier for a pulsating DC voltage (4,3% ripple) at 4mm safety jacks.
- DC voltage - and current reading only at 4MP version.
- Illuminated switch with contactor for central on / off.

Analog Display:

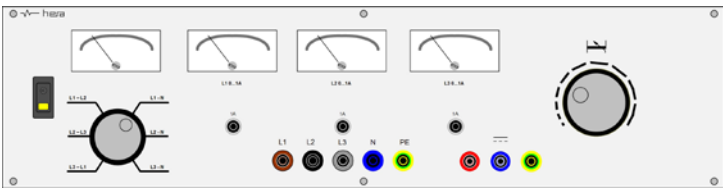
- 1x voltage reading with selector switch for changing the measuring point and 3x current reading (moving iron instrument, class 1,5).

Digital Display:

- 1x voltage reading with selector switch for measuring point change and 3x current display (3digit LED display, TrueRMS; 0,5% +/-1 digit).

MFD (Multifunctional Display):

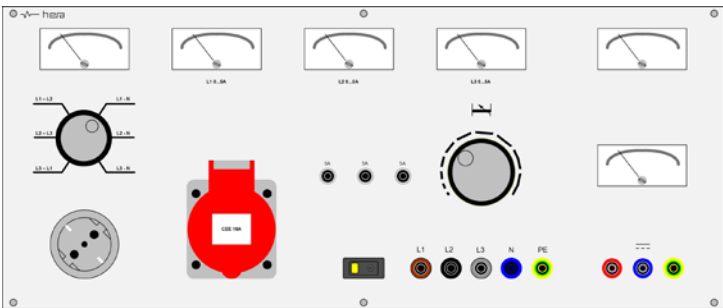
- Graphical LCD for the simultaneous indication of 4 freely programmable values.
- Phase voltages and - currents TRMS.
- Power (active, reactive and apparent, each phase and in total).
- Power factor each phase and in total.
- Frequency.
- High - and low values.
- Harmonic distortion of voltage and current.
- Harmonic analysis for voltage and current.
- Counter for active, reactive and apparant energy.
- Hour counter.



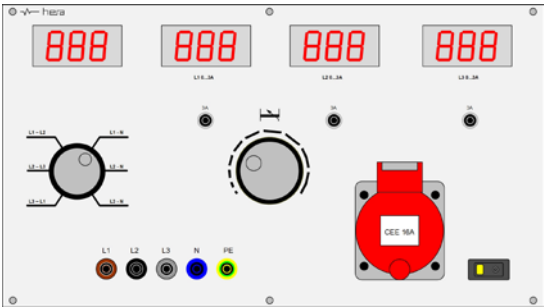
Variable AC/DC Source 3phase (2EP)



Variable AC Source 3phase (2EP) with MFD and USB Interface



Variable AC/DC Source 3phase (4MP)



Variable AC Source-3phase (3MP)

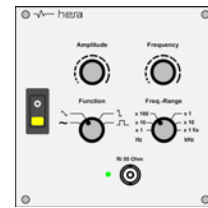
Variable AC/DC Source 3phases 33 S LLL A 04

S System	LLL Power	A Reading
4 EP	AC Source	1 analog
7 MP	AC/DC Source	5 digital
	401 0 – 230V / 400V / 1A 2EP / 3MP	6 MFD (only AC)
	403 0 – 230V / 400V / 3A 2EP / 3MP	7 MFD with USB
	405 0 – 230V / 400V / 5A 4MP	8 MFD with LAN
	408 0 – 230V / 400V / 8A 4MP	
	411 0 – 230V / 400V / 1A 2EP / 3MP	
	413 0 – 230V / 400V / 3A 2EP / 3MP	
	415 0 – 230V / 400V / 5A 4MP	
	418 0 – 230V / 400V / 8A 4MP	



EP/ MP ANALOG FUNCTION GENERATOR 200KHZ COMPACT

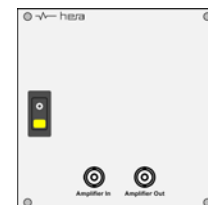
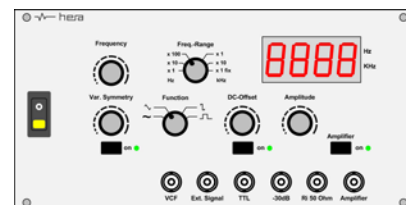
- Selector switch for wave forms: sinus, triangle, square, positive pulse.
- Selector switch for frequency range: x1, x10, x100Hz, x1kHz, x10kHz and 1kHz fix.
- Potentiometer for stepless fine-adjustment.
- Potentiometer for stepless adjustable amplitude 0...20V_{SS}.
- Output at BNC socket (Ri = 50Ω).



Function Generator 200 kHz COMPACT	
334.820.102	0,5EP
337.820.102	1MP

EP/ MP ANALOG FUNCTION GENERATOR 1MHZ (POWER AMPLIFIER)

- Function generator 1MHz with amplifier 100kHz, frequency adjustment with multiturn potentiometer.
- Frequency range adjustable with selector switch in 6 steps.
- Selector switch for wave form: sinus, triangle, square and external signal.
- Variable symmetry via potentiometer 20%...80%.
- Amplitude adjustment via potentiometer 0...30V_{SS} (unloaded).
- DC-Offset (neutral shifting) adjustable between -10V...+10V.
- Frequency setting via external voltage input (VCF).
- 4digit LED display for frequency indication.
- 5x BNC sockets with input for external signal; TTL output, 30dB output, 50Ω output.



Option Amplifier:

- Switchable in the range of 0,1Hz...100kHz.
- 40W_{EFF} continuous power at sinus with 5Ω.
- Short-circuit proofed due to retracted current characteristic.
- Max. output voltage 40V_{SS}.

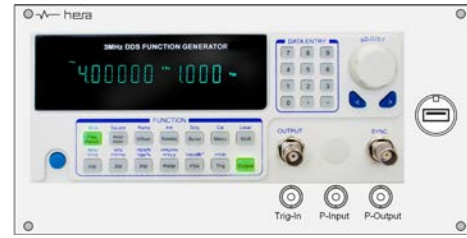
Function Generator / Amplifier		33 S .653.AAA	
S System	AAA Type		
3 EP	102	no amplifier	1EP / 2MP
6 MP	202	with amplifier	1EP / 2MP
	002	only amplifier	0,5EP / 1MP



EP/ MP DDS FUNCTION GENERATOR LC WITH POWER AMPLIFIER

DDS sweep function generators are applicable for a variety of signals, they can be used as common signal generator, as pulse generator or as sweep generator.

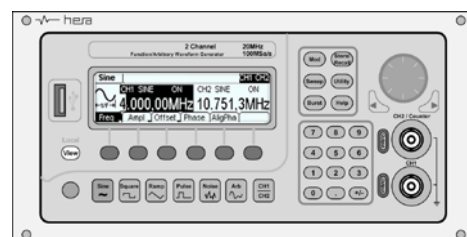
- 6digit LED display.
- Direct navigation per keypad or stepless.
- 16x signals e.g. sinus, rectangular, triangle, ramp, pulse negative/ positive, ...
- Frequency resolution: 10 μ Hz.
- Total distortion: < 1%.
- Rectangular signal: < 50ns rise -/fall time.
- Amplitude: 0 - 20V_{SS} (resolution: 5mV_{SS}).
- Offset: +/- 10V.
- Modulation: FM, AM, PM, PWM, FSK.
- Modulation frequency: 40 mHz - 20 kHz.
- USB interface.
- Power amplifier: 10W.
- Safety class: EN 61010-1; CAT II.



DDS Function Generator LC with Power Amplifier	
334.665.302 3MHz (1EP)	334.665.402 20MHz (1EP)
337.665.302 3MHz (2MP)	337.665.402 20MHz (2MP)

EP/ MP ARBITRARY FUNCTION GENERATOR, 2 CHANNEL

- 2 channel function generator (arbitrary signal generator) with frequency counter and USB interface. Easy menu navigation with graphical display.
- Sinus, rectangular, pulse, ramp, 48 pre-defined arbitrary signals, freely definable arbitrary output signals, noise.
- 2 channels.
- Frequency range sinus: 1 μ Hz - 20MHz, distortion <0.2%.
- Frequency range rectangular: 1 μ Hz - 5MHz, rise time <20ns.
- Frequency range triangle: 1 μ Hz - 150kHz.
- Frequency range arbitrary: 1 μ Hz - 5MHz, resolution 1 μ Hz.
- Wave form memory: 4kpts.
- Output Ri: 50 Ω .
- Sweep function: 1ms - 500s.
- Internal modulation: AM/ FM/ PM/ FSK.
- Amplitude: 2mV_{pp} - 10V_{SS} (channel 1)/ 2mV_{SS} - 3V_{SS} (channel 2).
- Integrated frequency counter (200MHz).
- USB interface for PC connection and USB stick.
- Incl. LabView driver and operating software.



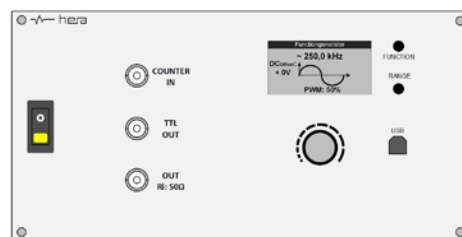
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Only fits in rack depth >= 300mm.

Arbitrary Function Generator, 2 Channel	
334.666.102	1EP
337.666.102	2MP

EP/ MP FUNCTION GENERATOR ICOM

- Background illuminated graphic LC display 60x30mm.
- Navigation via rotary switch with pushbutton function and 2 buttons.
- Illuminated 2poles switch for central on /off.
- Front side with USB - and rear side with LAN interface.
- LabView-driver and the compatible software IMODdesktop and IMODmobile for remote control.
- 3x BNC sockets.
(COUNTER IN, TTL OUT and OUT Ri: 50Ω).
- Basic functions: sinus, triangle, rectangular, saw tooth, pulse, trapezium.
- Frequency range: 50mHz – 10MHz (sinus), 50mHz – 1MHz (other signals).
- Arbitrary with value table (comfortable uploading with IMODdesktop).
- Other functions: PWM, TTL-output.
- Amplitude: $30V_{SS}$ (max. 1MHz), max. $3V_{SS}$ at 10MHz.
- Resolution: 12 Bit.
- Duty cycle: 0,1% ... 99,9%.
- DC Offset: $\pm 7,5V$.
- Frequency measurement: max. 50MHz.

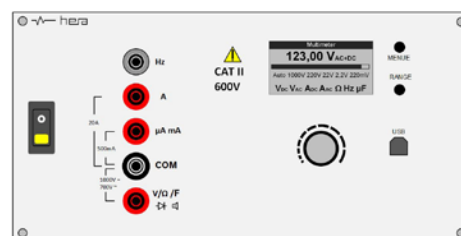


Function Generator ICOM

334.830.102	1EP
337.830.102	1MP

EP/MP DIGITAL MULTIMETER ICOM

- Background illuminated graphic LC display 6x30mm.
- Navigation via rotary switch with pushbutton function and 2 buttons.
- Illuminated 2poles switch for central on / off.
- Front side with USB - and rear side with LAN interface.
- LabView-driver and the compatible software IMODdesktop top and IMODmobile for remote control.
- 5x 4mm safety jacks (Hz, A, μA /mA, COM, V/ Ω /F/diode/continuity test/temperature).
- Resolution: 4 3/4 digit (50.000 counts).
- Voltage DC: $10\mu V$ – 1000V.
- Voltage AC TrueRMS: $10\mu V$ – 700V.
- Current DC: 10nA – 20A .
- Current AC TrueRMS: 10nA – 20A.
- Current inputs protected by fuse.
- Resistance: max. 50M Ω .
- Frequency: 100 μ Hz – 50MHz.
- Capacity: max. 5mF.
- Other functions: diode test, continuity test and temperature measurement.
- Range selection: manual or autoranging.
- CAT II 600V.



604.000.100 Immersion Sensor -70 ... +250°C



604.000.200 Surface Sensor -70 ... +250°C



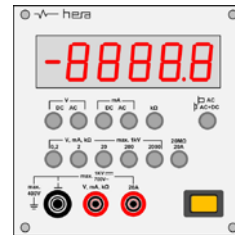
604.000.300 Kapton Sensor -190 ... +260°C

Digital Multimeter ICOM

334.710.602	Digital Multimeter ICOM (1EP)
337.710.602	Digital Multimeter ICOM (1MP)
604.000.100	Immersion Sensor -70 ... +250°C
604.000.200	Surface Sensor -70 ... +250°C
604.000.300	Kapton Sensor -190 ... + 260°C

EP/ MP DIGITAL MULTIMETER COMPACT

- 4 1/2 digit LED display with a digit height of 13mm.
- Functions: AC / DC voltage, AC / DC current and resistance.
- TrueRMS measurements.
- Range selection: manual with switches.
- Measuring cycle: approx. 2,5 measurements / sec.
- DC voltage: 200mV max. 1000V in 5 ranges (resolution: max. 10µV).
- DC current: 200µA max. 20A in 6 ranges (resolution: max. 10nA).
- AC voltage: 200mV max. 1000V in 5 ranges (resolution: max. 10µV).
- AC current: 200µA max. 20A in 6 ranges (resolution: max. 10nA).
- Resistance: 200Ω max. 20MΩ in 5 ranges (resolution: max. 10mΩ).
- Connection at 4mm safety jacks.
- Illuminated 2poles switch for central on /off.



Digital Multimeter Compact	
334.710.402	0,5EP
337.710.402	1MP

EP/ MP DIGITAL MULTIMETER LC2

- TrueRMS multimeter 6000digits with easy to read LC display and bargraph.
- Measuring range: manual and autoranging.
- Measuring range AC / DC Voltage: 600mV...1000V.
- Measuring range AC / DC Current: 600µA...10A (shortly up to 20A).
- Measuring range resistance: 600Ω...60MΩ.
- Measuring range capacity: 6nF...6mF.
- Measuring range inductivity: 600µH...100mH.
- Measuring range temperature: -40°C...1000°C.
- Measuring range frequency: 6kHz...60MHz.
- Continuity test, transistor -, thyristor - and diode test.
- Min. - / max. - and hold function.
- CAT II 600V.
- USB interface (in EP rear sided).
- Incl. measuring leads, temperature probe and operating software.



Digital Multimeter LC2	
334.711.303	1EP
337.711.303	2MP

EP/ MP PRECISION MULTIMETER 6 1/2 DIGIT, LAN

- Bright and easy to read, high resolution graphic color display, diagonal 109mm for the presentation of curves, histograms, bargraphs, statistics and mathematic functions. Accuracy: 75ppm (max. drift).
- Measuring rate up to 1.000 measurement/sec.
- Voltage DC: 100mV - 1.000V / resolution from 1 μ V.
- Voltage AC: 100mV - 750V / resolution from 1 μ V.
- Current DC / AC: 100 μ A - 10A / resolution from 1nA.
- Resistance 100 Ω - 100M Ω / resolution from 1m Ω .
- Frequency / period 3Hz - 300kHz.
- Capacity measurment 1nF to 100 μ F.
- Temperature with optional RTD/PT100 and thermistor.
- Constant measuring voltage of 5V (LED)-diodes and -arrays.
- Truevolt-technology for reduction of noise and measuring errors.
- Drag-and-drop-data transfer via front-USB.
- I/O-interface: USB, LAN with external trigger.



Only fit in rack depth ≥ 300 mm.

Precision Multimeter 6 1/2 Digit, LAN	
334.702.302	Keysight 34461A (1EP)
337.702.302	Keysight 34461A (2MP)



EP/ MP UNIVERSAL HOLDER FOR HANDHELD INSTRUMENTS

- Front panel with 2 adjustable brackets for handheld device with width: 70 - 90mm and depth: 25 - 45mm.
- The adjustable brackets allow the stepless adjustment of the brackets in depth and angle.
- The universal holder is for the integration of handheld devices into a bench rack system, with the ability to take those out if necessary.

Universal Holder for Handheld Instruments	
334.708.902	0,5EP
337.708.902	1MP

Handheld Instruments	
590.105.100	Digital Multimeter METRALINE DM62
590.105.300	Digital Multimeter METRAHIT TECH
590.105.400	Calibrator METRAHIT CAL
590.105.500	Combination of LCR Meter and Multimeter
590.105.600	LCR Meter



MP MULTIMETER, LCR METER AND CALIBRATOR

Light grey aluminium front panels with abrasion proofed silkscreen printing and flush integrated handheld instruments.

TRMS Multimeter (DM62):

- Resolution: 6600 pxl (3 6/7 digit) and analog bargraph (66 dots).
- Dual background illuminated digital display.
- Basic accuracy: 0,4% VDC.
- Band width: VAC TRMS 2kHz.
- Voltage: VDC 100µV ...1000V and VAC TRMS 100µV ...1000V.
- Current: ADC 10µA ...10A and AAC TRMS 10µA ...10A.
- Resistance: 100mΩ ...60MΩ.
- Temperature: -50...+1.300°C thermo couple type K.
- Frequency measurement: 0,01Hz ...10,00MHz.
- Duty cycle: 1% ...98,9% (1kHz).
- Capacity measurement: 1pF ...40,00mF.
- Continuity - and diode test.
- Hold / peak / min-max / relative (zero).
- Measuring range: manual selection and autoranging.
- Automatic socket blocking.

Precision Digital Multimeter TECH 4½digit TRMS:

- 3 sockets with automatic socket blocking.
- Measuring range: manual selection and autoranging.
- Automatic data logging DATA/ MIN/ MAX.
- Background illuminated display with big figures and bargraph.
- Voltage AC TRMS - DC - AC+DC.
- Current AC TRMS - current DC - current AC+DC TRMS.
- Frequency (Hz by voltage and current).
- Temperature measurement with K thermo couples.
- Capacity measurement, continuity - and diode test.
- Incl. DKD calibration certificate.

Calibrator and Multimeter for electrical Signals (CAL):

- 0 - 24mA source and 0 - 300mA measurement.
- 0 - 20mA and 4 - 20mA range selection.
- Output voltage 0 - 300mV, 3, 10 and 15V.
- Resistance with 2- and 4 wire-simulation max. 0,01mΩ.
- Resolution high resistance measurement max. 30mΩ.
- Simulation for RTD temperature sensors.
- °C/ °F, Pt100/ 1000, Ni100/ 1000.
- Simulation for a variety of thermocouples (J, L, T, U, K, E, S, R, B, N) with internal or external compensation of cold joints.
- Frequency generator for rectangular pulses (1Hz ...1000Hz).
- Ramp -, step -, hold function.
- Incl. DKD calibration certificate.

Multifunctional Meter (Multimeter and LCR Meter):

- 3 ½ digit LCD display with background illumination.
- max. - and measuring hold function.
- DCV 200mV / 20 / 200 / 600V; 100µV; +/- 0,5% + 1 dgt.
- ACV 200mV / 2 / 20 / 200 / 600V; 100µV; +/- 0,8% + 3 dgt.
- DCA 20µA / 2 / 200mA / 10A; 10nA; +/- 0,8% + 1 dgt.
- ACA 20µA / 2 / 200 mA / 10A; 10nA; +/- 1,0% + 3 dgt.
- Frequency range: 40 - 400Hz.
- Ohm 200W / 2 / 20 / 200kW / 2 / 20 / 2000MW; 0,1W; +/- 0,8% 1 dgt.
- Capacity 20 / 200nF / 2 / 100µF; 10pF; +/- 2,5% + 5 dgt.
- Inductivity 2 / 20 / 200mH / 20H; 1µH; +/- 2,0% + 10 dgt.
- Frequency 2 / 20 / 200kHz / 2 / 10MHz; 1Hz; +/- 0,1% + 3 dgt.
- Temperature -40 ... +1000°C; +/- 1,0% + 3 dgt.
- Transistor test, diode - and continuity test with buzzer.
- Incl. test leads, multifunctional adapter and temperature probes.

LCR Meter:

- 4 1/2 digits 27mm LC display with background illumination.
- Resistance: 110Ohm / 1,1 / 11 / 110kOhm / 1,1 / 11 / 110MΩ, ±1,2% + 8 dgt., 10mΩ
- Capacity: 11 / 110nF / 1,1 / 11 / 110µF / 1,1 / 11 / 110mF, ±3,0% + 10 dgt., 1pF
- Inductance: 11 / 110mH / 11 / 20H, ±2,0% + 0,2mH, 1nH
- Measuring series: 3 - 4 per sec.
- Min. and max. value hold function.
- Relative value measurement.
- Diode - and continuity test.



DM62



TECH



CAL



DMM+LCR



LCR-Meter

10

Digital Multimeter, LCR-Meter and Calibrator

337.708.302	TRMS Multimeter DM62, incl. power supply (1MP)
337.708.402	Precision Multimeter TECH 4½ digit TRMS, incl. power supply (1MP)
337.708.602	Calibrator and Multimeter for electrical signals CAL, incl. power supply (1MP)
337.708.702	Multifunctional Meter (DMM + LCR), incl. power supply (1MP)
337.708.802	LCR Meter, incl. power supply (1MP)

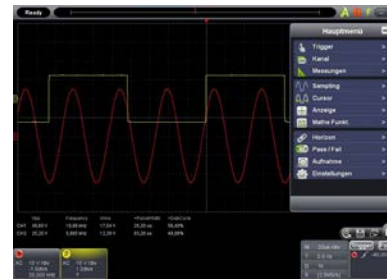
KP/EP/MP PC OSCILLOSCOPE

Front panel with BNC jacks, USB adapter, illuminated on/off switch. The PC oscilloscope is completely wired within the bench rack.

Incl. probes, USB cable and software for the direct transfer of the measuring results to the PC.

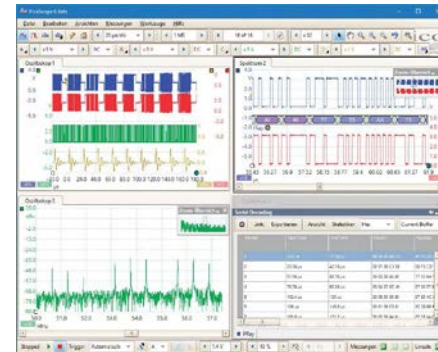
PC Oscilloscope PeakTech:

- Total memory 20 Mio. dots for all channels (P1290: max. 10.000 dots).
- Rear sided LAN interface (not P1290).
- Front sided USB interface (isolated at P1290).
- Input max.: 40Vpp (USB) or 400Vpp (LAN) 400Vpp (USB) at P1290.



PC Oscilloscope PicoScope, Series 2000:

- Sampling rate: 1GS/s.
- Incl. function generator and arbitrary signal generator.
- Front side USB 2.0 HighSpeed.
- Spectrum analyzer function.



PC Oscilloscope PeakTech				3SS .AAA .002
SS	System	AAA	Type	
24	3 KP	925	P1290: 2 Channel 25MHz (100MS/s)	
34	0,5 EP	926	P1280: 2 Channel 60MHz (500MS/s)	
37	0,5 MP	927	P1285: 2 Channel 100MHz (1GS/s)	
		928	P1325: 4 Channel 60MHz (500MS/s)	

PC Oscilloscope PicoScope				3SS .AAA .002
SS	System	AAA	Type	
24	3 KP	827	2207B: 2 Channel 70MHz (64MS)	
34	0,5 EP	829	2208B: 2 Channel 100MHz (128MS)	
37	0,5 MP	847	2407B: 4 Channel 70MHz (64MS)	
		849	2408B: 4 Channel 100MHz (128MS)	

MP DIGITAL STORAGE OSCILLOSCOPE

In front panel integrated digital storage oscilloscope incl. BNC cables, PASS/ FAIL adapter, USB cable, probes and software.

- 8" TFT color display (800x600pix).
- Autoset - and autoscale function.
- FAIL / PASS function.
- Front sided USB interface, rear sided LAN interface.



► More technical details on demand.

► Other types and brands available.

Digital Storage Oscilloscope (PEAKTECH)	
338.101.030	30MHz / 2 Channel / 125MSa/s (3MP)
338.101.070	70MHz / 2 Channel / 500MSa/s (3MP)
338.101.100	100MHz / 2 Channel / 1GSa/s (3MP)
338.101.200	200MHz / 2 Channel / 2GSa/s (3MP)

Digital Storage Oscilloscope LCD (GW Instek)	
930.388.100	100MHz / 2 Channel / 2GSa/s (3,5MP)
930.313.000	100MHz / 4 Channel / 2GSa/s (3,5MP)
930.425.100	200MHz / 2 Channel / 2GSa/s (3,5MP)
930.295.700	200MHz / 4 Channel / 2GSa/s (3,5MP)

EP/MP CONSTANT CURRENT SOURCE

- Selector switch for 4mA, 20mA or 0...50mA.
- Load voltage: max. 30V.
- 10turn potentiometer for 0...50mA.
- LED display 3digit.
- LED indication (load permitted / not permitted).
- Output on 4mm safety jacks.
- Illuminated 2poles switch.



Constant Current Source	
334.050.402	0,5EP
337.050.402	1MP

EP/MP CONSTANT VOLTAGE SOURCE

- Selector switch for 1V, 10V and 0...30V.
- Short circuit current: 100mA.
- 10turn potentiometer for 0...30V.
- LED display 3digit.
- LED indication (load permitted / not permitted).
- Output on 4mm safety jacks.
- Illuminated 2poles switch.



Constant Current Source	
334.050.202	0,5EP
337.050.202	1MP

EP/MP DIGITAL THERMOMETER

- Temperature meter for PT100/PT1000 probe according to EN 60751.
- 3-wire technology with automatic compensation of line resistance.
- Measuring current max. 1,5mA. Analog output (not isolated) in mV/°C.
- Accuracy: $\pm 0,1\% \pm 1 \text{ D o. M.}$
- Measuring rate 2,5M/sec.
- 3 1/2 digit LED display (12,5mm; red).
- Incl. rod probe or surface sensor in 3-wire technology.



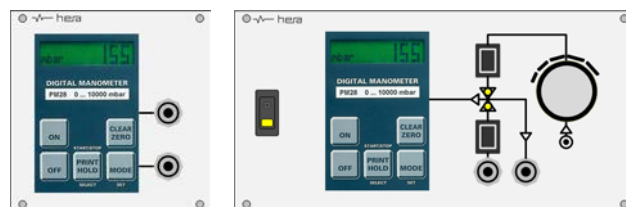
Digital Thermometer	
334.060.102	-100,0°C ..+199,9°C (0,5EP)
334.060.202	-100,0°C...+400°C (0,5EP)
337.060.102	-100,0°C ..+199,9°C (1MP)
337.060.202	-100,0°C...+400°C (1MP)

EP/MP PRESSURE MEASUREMENT / - CALIBRATOR DIGITAL

- Digital instrument for pressure measurement with integrated pressure sensor for differential -, relative - or absolute pressure.
- 3½digit LC display.
- Piezoresistive pressure sensor.
- Measuring range HI, class 0.2% o. E.
- Measuring range LO, class 0.5% o. E.
- In- and outlet with selfclosing fast connectors 4/6mm.

Calibrator with:

- Precision pressure control.
- Selector switch for internal or external supply with 2x 3/2 magnetic valve with LED mode indication.
- Illuminated 2poles switch.
- Rear side pressure connector.



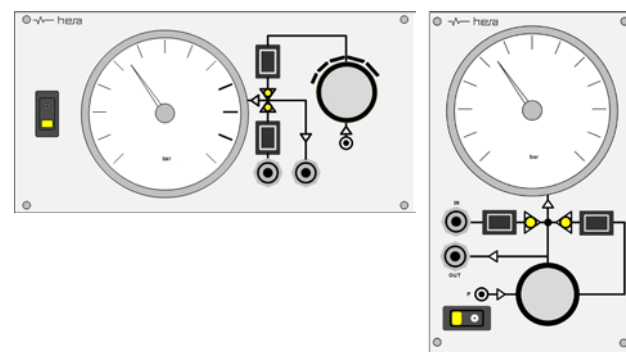
Pressure Measurement - / Calibrator digital

334.072.502	Pressure Measurement 0 - 2000mbar (0,5EP)
334.071.502	Pressure Measurement 0 - 10bar (0,5EP)
334.072.602	Pressure Calibrator 0 - 2000mbar (1EP)
334.071.602	Pressure Calibrator 0 - 10bar (1EP)
337.072.502	Pressure Measurement 0 - 2000mbar (1MP)
337.071.502	Pressure Measurement 0 - 10bar (1MP)
337.072.602	Pressure Calibrator 0 - 2000mbar (1MP)
337.071.602	Pressure Calibrator 0 - 10bar (1MP)



EP/MP PRESSURE CALIBRATOR ANALOG

- Precision pressure regulator.
- Selector switch for internal or external supply with 2pcs 3/2 way magnetic valve with LED mode indication.
- In- and outlet via selfclosing fastconnectors 4/6mm.
- Pressure gauge class 1,0.
- Illuminated 2poles switch.
- Completely hosed with open hose end 4/6.



Pressure Calibrator analog

334.070.102	Vacuum (1EP)
334.073.102	0 - 2,5bar (1EP)
334.076.102	0 - 6bar (1EP)
334.071.102	0 - 10bar (1EP)
337.070.102	Vacuum (1MP)
337.073.102	0 - 2,5bar (1MP)
337.076.102	0 - 6bar (1MP)
337.071.102	0 - 10bar (1MP)



MP APPLIANCE TESTER VDE 0701/0702

- Device for performing DIN VDE 0701 – 0702 tests, repeating test BGV A3 and DIN EN 62353.
- Direct selection of the individual measurement types with function buttons.
- Automatic adaption of limiting value (protective conductor, insulation).
- 2 poles measurement (low ohmic, insulation, equivalent leakage current, voltage)
- Clear text operation with schematic diagram and green / red LED indication for ok / failure.
- Large display, rich in contrast.
- Mains connection is checked for PE contact and automatic switch off in case of dangerous leakage current of test item.
- Bluetooth and USB interface.
- Fast procedure of all activated tests inclusive function test with real-effective-power indication in only one step.
- Instantaneous pole reversal.

Measurements (usage failure 5% v.M. + 1% v.B.)

- Protective conductor: $0,000\Omega \dots 4,000\Omega$
test current: 200mA DC / open-circuit voltage 10V.
- Insulation resistance: $0,00M\Omega \dots 20,00M\Omega$,
open-circuit voltage: 50V, 250V, 500V
short-circuit current: 1mA.
- Integrated leakage current switch-off,
residual voltage > approx. 20 mA
- Equivalent leakage current: $0,00mA \dots 20,00mA$,
open-circuit voltage: approx. 200V AC (max. 2,5 mA).
- Difference current: $0,00mA \dots 20,00mA$ AC
according DIN EN 61557-14 for correct evaluation of the harmonic waves.
- Touch protection: $0,000mA \dots 4,000mA$.
- Mains voltage measurement: 200V...250V AC.

Incl. Accessory:

- Interface Bluetooth and USB C.
- Measuring leads 2m, 1x red + 1x black.
- Report Master and Report Master App for 1 year.
- Inhouse calibration certificate.

Optional Test Software:

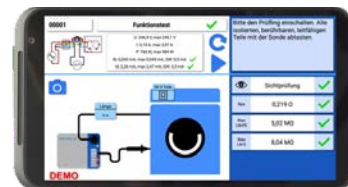
- Windows Software Safety-Remote:
Software for report creation and remote access, as well as data base functionality.
- Android data base app Test Master:
Menu-guided app with camera documentation, report creation and SQLITE data base.



Device Tester VDE 0701/0702 (2MP)



Windows Software Safety-Remote



Android Test Master App



Appliance Tester and Test Software

338.700.302	Appliance Tester VDE 0701/0702 (2MP)
338.700.309	Windows Software Safety-Remote
338.701.308	Android Data Base App Test-Master

Notices:

Notices:

Notices: