

Housing for electronic instruments



Mitraset® 19" housings are in accordance with **MIL-T 28800**, **MIL-STD 810 F**, **EIA** and **IEEE Standards** and are designed to accommodate electronic devices in a 19" rack.

They also protect equipment against general environmental effects such as impact, shock and vibration, protection against electromagnetic interferences such as radio waves, lightning, etc., as well as general environmental effects such as heat, humidity, dust, etc., to meet these stringent requirements.

Mitraset® 19" housings have special design features. Casing is constructed of precision-welded, high-tensile aluminum sheets to which elastomeric shocks are suspended in an shock isolated frame, made of extrusions.

The device to be protected is inserted into this frame and screwed in. The shock isolated frame is connected to the casing via rails and rubber shock mounts, with the material and type of mount selected in accordance with requirements generally based on weight and center of gravity of the component.

Details

- Protection class IP 65 (see page 54) in accordance with DIN 40 050 and ICE 34-5/529 through the process of seam welded housings and lids with sealed gaskets.
- Housings are stackable and are front justified.
- All sizes are stackable with one another (except depth greater than 24" (610 mm)).
- Inside frame made of aluminum extrusions suspended by shock mounts.
- Spring loaded handles are countersunk and placed on sides of housing.
- All sides and lids rely on reinforcement rib construction (except depth greater than 24" (610 mm)).
- Minimum of 8 elastomeric shocks or wire rope shock absorbers (see page 22) with slide rails to support the shock isolated frame.
- Completely removable shock isolated frame.
- Quick release, removable rack frame available as an option.
- Lids with quick-release fasteners.
- Available in various depths and heights.
- Extensive special range for special applications and depth.



→ Mitraset® Components



Specifications MIL-STD-810 D



Extract from the results of testing to MIL-STD-810 D / VG 95446-2

→ 5.11 Shock test

Test 516.3 according to VG MIL-STD-810 D-17. The Shock test with recording of the damping is to be carried out in the 6 main directions with each 3 half-sine shocks at an acceleration of 40 gees and a pulse time $t = 7$ ms.

→ 5.3 Strength of carrying handles

The test item shall be suspended in the normal position and be loaded so that 375 N / 84.3 pounds will act on each handle. After that, the test item shall be suspended on each handle and be loaded with 750 N / 168.7 pounds. Test duration 5 min.

→ 5.4 Water spray and dust test

In accordance with DIN EN 60 529. Degree of protection IP 65 (see page 54).

→ 5.5.2 High temperature test

Test 501.2 according to VG MIL-STD-810 D-3, method I A2. 24 hours, 160 °F (71 °C).

→ 5.6.2 Low temperature test

Test 502.2 according to VG MIL-STD-810 D-4, method I C2. 24 hours, - 60 °F (- 51 °C).

→ 5.7.2 Temperature change test

Test 503.2 according to VG MIL-STD-810 D-5, method I to III by 3 × 4 h at 160 °F (71 °C) and - 60 °F (- 50 °C /).

→ 5.8.2 Damp heat test

Test 507.2 according to VG MIL-STD-810 D-8, method III.

→ 5.9.2 Vibration test

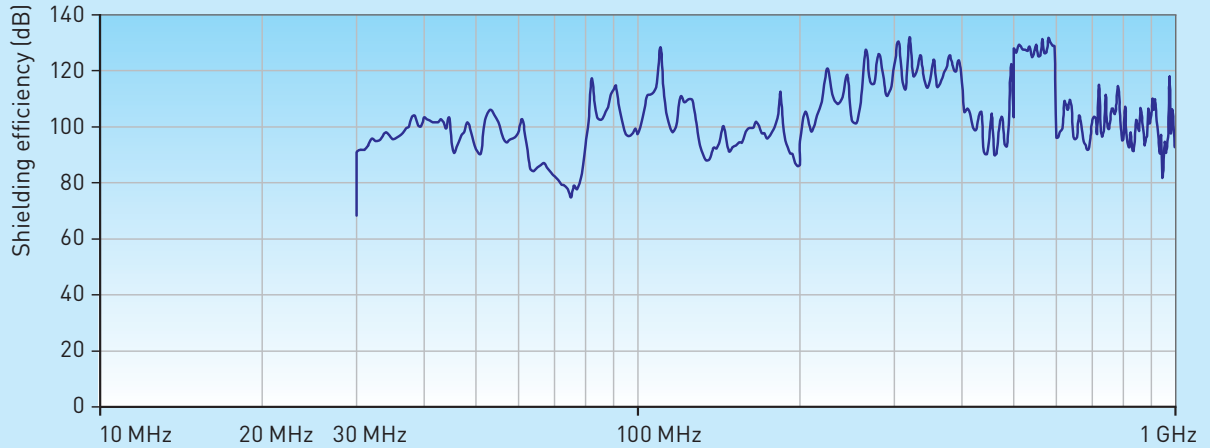
1. Test 514.3 according to VG-MIL-STD-810 D-15 figures 514.3-7, 514.3-8 and 514.3-9, depending on the vibration axis, each 10 min per axis.
2. Determination of resonance during the random-vibration under paragraph 1.
3. Random vibration according to figure 514.3-36 in the 3 main axes, each 1 hour per axis. The paragraphs 1 to 3 are to be carried out in 1 axis each complete.

→ Free fall from a height of 48" (1.20 m) on all faces, edges and corners

Free fall from a height of 48" (1.20 m) on all possible impact surfaces but ensuring by way of a minimum impact at the weakest point.

EMI/RFI Shielding

Measurement of Shielding Efficiency to MIL-STD -285, Measured Values



Measured on a 7 HE,
18.90" (480 mm) nominal depth housing.



For housings with lids fitted:

- This is achieved by using a special lid gasket.
- Cutout with RF honeycomb filter. Sealing to IP 54.
Mainly for installation in the lid.

For housings without lids fitted:

- By fitting aluminum infill panels on 4 sides of frame.
Optionally perforated for better circulation of the air. In addition, the front and back of the frames are fitted with an RFI Gasket. Measured values for this see above.
- By fitting a flexible skirt seal made from conductive material between the housing and the frame. Front panel and rear panel must be adapted by the user so that they are RF-shielded.



Vibration damping



Undesirable mechanical vibrations often occur in transport and in many other applications. These may have a negative effect on the function of electronic components and thus represent an increased safety risk.

ZARGES Mitraset® housings offer a solution to vibration problems in military, aeronautical, tactical and industrial applications. They are tested to MIL-STD-810 F.

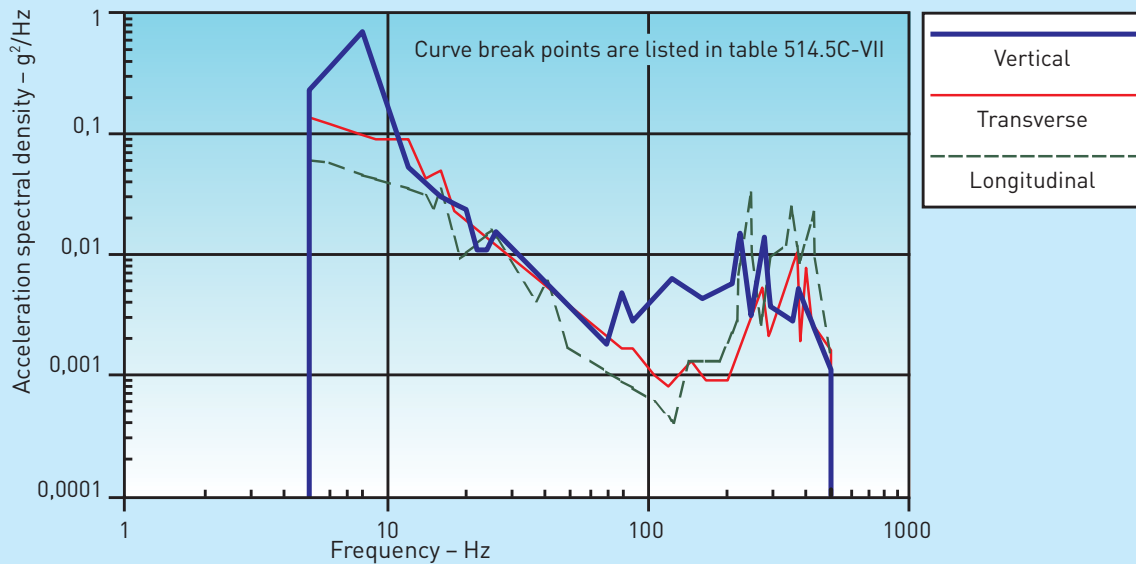
The ZARGES Mitraset® housing has been developed and undergone successful testing in accordance with MIL-STD-810 F.

The following diagram shows the test specifications to FIGURE 514.5C-3. Composite wheeled vehicle vibration exposure.

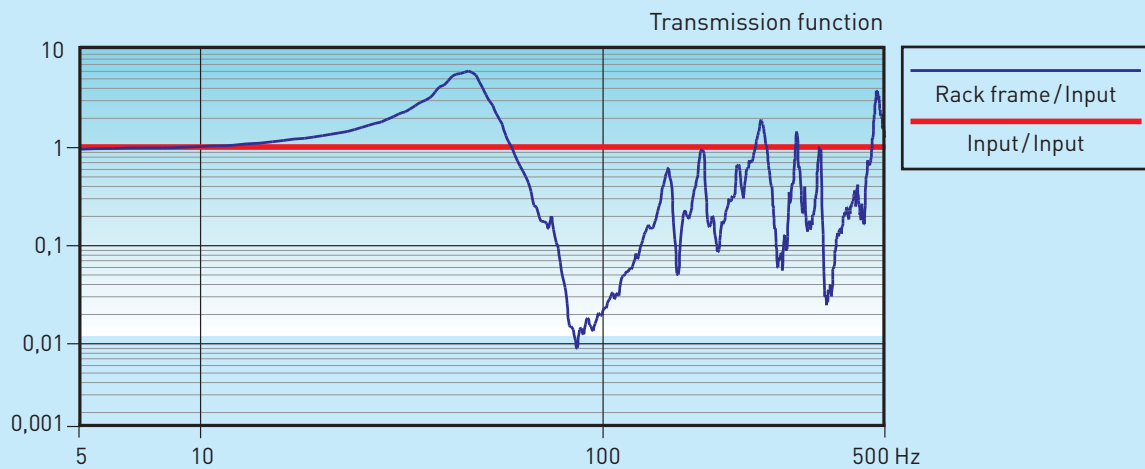
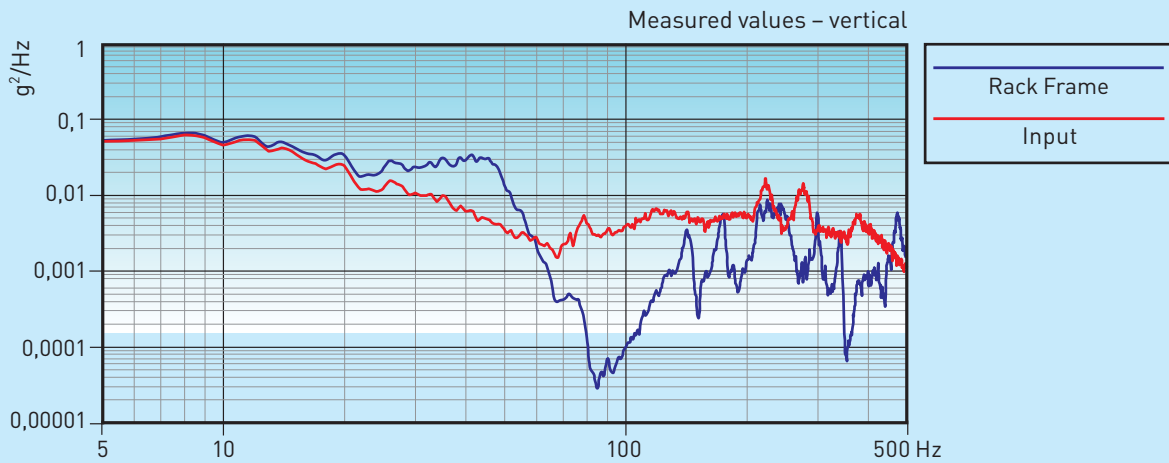
MIL-STD-810 F, FIGURE 514.5C-3.

Composite wheeled vehicle vibration exposure

(MIL-STD-810 F, 1 January 2000, ANNEX C)



Vibration exposure in accordance with MIL-STD-810 F Category 4
 Figure 514.5 C-3 Composite wheeled vehicle vibration exposure



Dimensions and weights

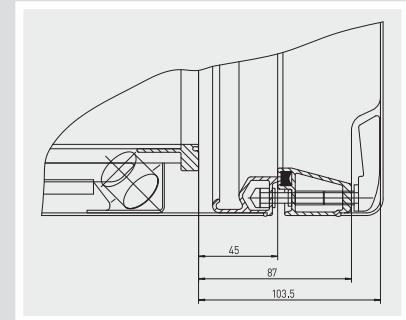


Rack frame:

- Equipment Clearance (width)
17.7" (450 mm)
- Equipment Clearance (height)
1U – 1.75" (44.5 mm)
- Equipment Clearance (depth)
8.62" (219 mm), 13.78" (350 mm),
18.9" (480 mm), 24.02" (610 mm),
30.0" (762 mm)

Mounting Rails to EIA 310

- Universal Spacing.
- Threads 10 – 32 Class UNF-2B.
- Others on request.



Housings

Order No.	Inner height units	Nominal depth mm	Nominal depth inch	Ext. dimensions of body without lid (H × W × D, approx. mm)	Ext. dimensions of body without lid (H × W × D, approx. inch)	Weight kg (with 2 std. lids)	Weight lbs (with 2 std. lids)
45 702	3	219	8.62	214.5 × 534 × 303	8.44 × 21.02 × 11.93	10.42	22.98
45 704	3	350	13.78	214.5 × 534 × 434	8.44 × 21.02 × 17.09	12.42	27.38
45 706	3	480	18.90	214.5 × 534 × 564	8.44 × 21.02 × 22.20	14.51	31.98
45 803	3	610	24.02	214.5 × 534 × 694	8.44 × 21.02 × 27.32	17.32	38.18
45 863	3	762	30.00	214.5 × 534 × 856	8.44 × 21.02 × 33.70	19.99	44.08
45 708	4	219	8.62	259.0 × 534 × 303	10.20 × 21.02 × 11.93	11.19	24.66
45 710	4	350	13.78	259.0 × 534 × 434	10.20 × 21.02 × 17.09	13.18	29.06
45 712	4	480	18.90	259.0 × 534 × 564	10.20 × 21.02 × 22.20	15.31	33.76
45 804	4	610	24.02	259.0 × 534 × 694	10.20 × 21.02 × 27.32	18.31	40.36
45 864	4	762	30.00	259.0 × 534 × 856	10.20 × 21.02 × 33.70	21.00	46.30

Housings

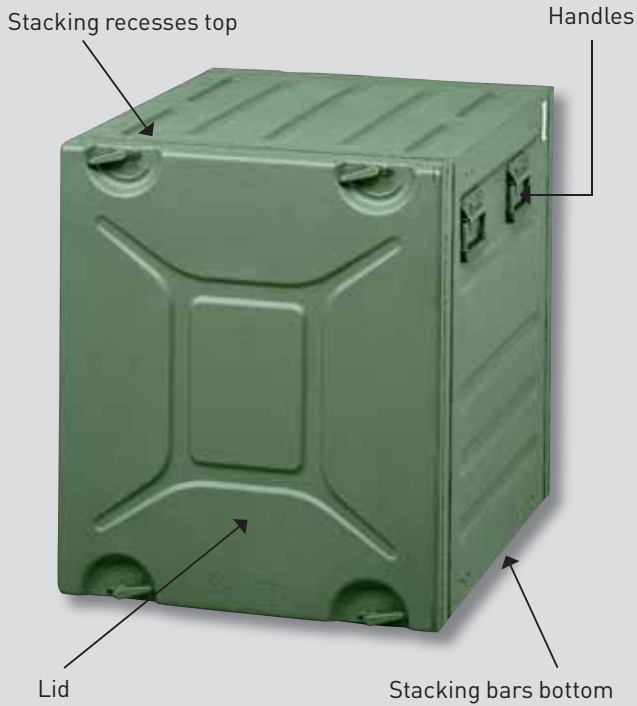
Order No.	Inner height units	Nominal depth mm	Nominal depth inch	Ext. dimensions of body without lid (H × W × D, approx. mm)	Ext. dimensions of body without lid (H × W × D, approx. inch)	Weight kg (with 2 std. lids)	Weight lbs (with 2 std. lids)
45 714	5	219	8.62	303.5 × 534 × 303	11.95 × 21.02 × 11.93	11.90	26.24
45 716	5	350	13.78	303.5 × 534 × 434	11.95 × 21.02 × 17.09	13.90	30.64
45 718	5	480	18.90	303.5 × 534 × 564	11.95 × 21.02 × 22.20	15.98	35.24
45 805	5	610	24.02	303.5 × 534 × 694	11.95 × 21.02 × 27.32	19.30	42.54
45 865	5	762	30.00	303.5 × 534 × 856	11.95 × 21.02 × 33.70	22.00	48.51
45 720	6	219	8.62	348.0 × 534 × 303	13.70 × 21.02 × 11.93	12.48	27.52
45 722	6	350	13.78	348.0 × 534 × 434	13.70 × 21.02 × 17.09	14.61	32.22
45 724	6	480	18.90	348.0 × 534 × 564	13.70 × 21.02 × 22.20	16.88	37.22
45 806	6	610	24.02	348.0 × 534 × 694	13.70 × 21.02 × 27.32	20.19	44.52
45 866	6	762	30.00	348.0 × 534 × 856	13.70 × 21.02 × 33.70	22.90	50.49
45 726	7	219	8.62	392.5 × 534 × 303	15.45 × 21.02 × 11.93	13.20	29.10
45 728	7	350	13.78	392.5 × 534 × 434	15.45 × 21.02 × 17.09	15.38	33.90
45 730	7	480	18.90	392.5 × 534 × 564	15.45 × 21.02 × 22.20	17.60	38.80
45 807	7	610	24.02	392.5 × 534 × 694	15.45 × 21.02 × 27.32	21.32	47.00
45 867	7	762	30.00	392.5 × 534 × 856	15.45 × 21.02 × 33.70	24.00	52.91
45 732	8	219	8.62	437.0 × 534 × 303	17.20 × 21.02 × 11.93	13.81	30.44
45 734	8	350	13.78	437.0 × 534 × 434	17.20 × 21.02 × 17.09	15.89	35.04
45 736	8	480	18.90	437.0 × 534 × 564	17.20 × 21.02 × 22.20	18.21	40.14
45 808	8	610	24.02	437.0 × 534 × 694	17.20 × 21.02 × 27.32	22.20	48.94
45 868	8	762	30.00	437.0 × 534 × 856	17.20 × 21.02 × 33.70	24.90	54.90
45 738	9	219	8.62	481.5 × 534 × 303	18.96 × 21.02 × 11.93	14.39	31.72
45 740	9	350	13.78	481.5 × 534 × 434	18.96 × 21.02 × 17.09	16.70	36.82
45 742	9	480	18.90	481.5 × 534 × 564	18.96 × 21.02 × 22.20	19.01	41.92
45 809	9	610	24.02	481.5 × 534 × 694	18.96 × 21.02 × 27.32	23.10	50.92
45 869	9	762	30.00	481.5 × 534 × 856	18.96 × 21.02 × 33.70	25.80	56.88
45 744	10	219	8.62	526.0 × 534 × 303	20.71 × 21.02 × 11.93	15.01	33.10
45 746	10	350	13.78	526.0 × 534 × 434	20.71 × 21.02 × 17.09	17.42	38.40
45 748	10	480	18.90	526.0 × 534 × 564	20.71 × 21.02 × 22.20	19.69	43.40
45 810	10	610	24.02	526.0 × 534 × 694	20.71 × 21.02 × 27.32	23.90	52.70
45 870	10	762	30.00	526.0 × 534 × 856	20.71 × 21.02 × 33.70	26.60	58.64
45 750	11	219	8.62	570.5 × 534 × 303	22.46 × 21.02 × 11.93	15.40	33.96
45 752	11	350	13.78	570.5 × 534 × 434	22.46 × 21.02 × 17.09	17.90	39.46
45 754	11	480	18.90	570.5 × 534 × 564	22.46 × 21.02 × 22.20	20.30	44.76
45 811	11	610	24.02	570.5 × 534 × 694	22.46 × 21.02 × 27.32	24.70	54.46
45 871	11	762	30.00	570.5 × 534 × 856	22.46 × 21.02 × 33.70	27.41	60.42
45 756	12	219	8.62	615.0 × 534 × 303	24.21 × 21.02 × 11.93	15.98	35.24
45 758	12	350	13.78	615.0 × 534 × 434	24.21 × 21.02 × 17.09	18.62	41.04
45 760	12	480	18.90	615.0 × 534 × 564	24.21 × 21.02 × 22.20	21.11	46.54
45 812	12	610	24.02	615.0 × 534 × 694	24.21 × 21.02 × 27.32	25.60	56.44
45 872	12	762	30.00	615.0 × 534 × 856	24.21 × 21.02 × 33.70	28.31	62.41
45 874	14	762	30.00	704.0 × 534 × 856	27.72 × 21.02 × 33.70	29.60	65.26
45 816	16	610	24.02	793.0 × 534 × 694	31.22 × 21.02 × 27.32	29.29	64.58
45 876	16	762	30.00	793.0 × 534 × 856	31.22 × 21.02 × 33.70	32.01	70.56

Further sizes are available upon request. Height of housing with stacking foot = external dimension (nominal dimension) + 0.45" (11.5 mm). Depth of lid = 2.48" (63 mm). Depth of special lid to be agreed. All housings can be supplied with rear panel welded in position. For the weight of lid please see page 16.

Lids, handles, stacking features

Details

- Stacking recess on the top.
- Additional strengthening ribs on the top and side walls.
- Recessed handles on the sides.
- Recess also useful for pressure relief valve and humidity indicator.
- Screw-down lids can also be supplied.
- Additional handles on lids available.

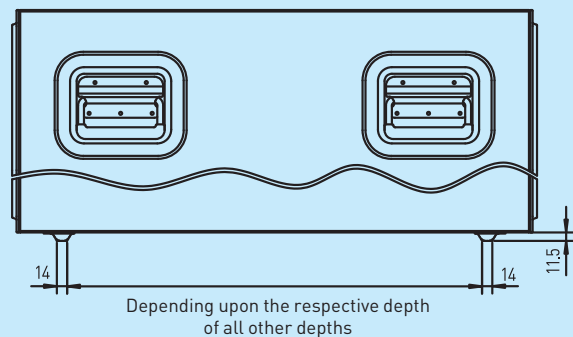
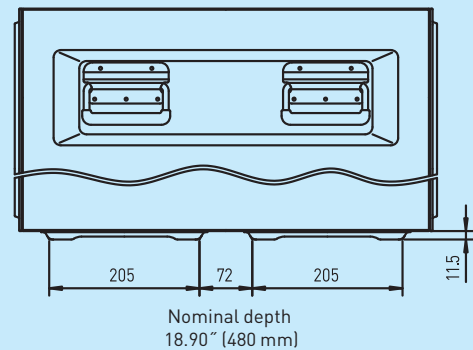
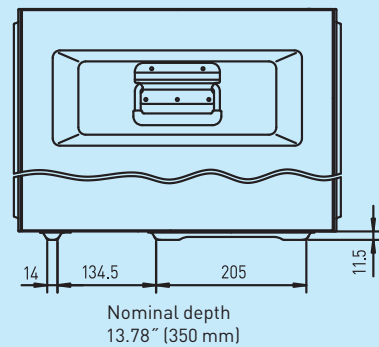
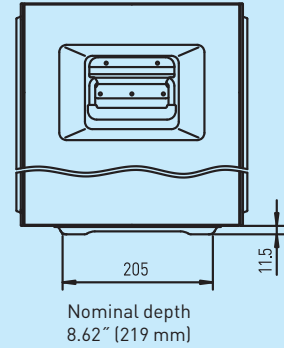


Technical features of lid

Lid	Order No.	Ext. dimensions (H × W × D, approx. mm)	Ext. dimensions (H × W × D, approx. inch)	Weight per lid (approx. kg)	Weight per lid (approx. lb)
3	45 761	534 × 214.5 × 63	8.44 × 21.02 × 2.48	1.9	4.19
4	45 762	534 × 259.0 × 63	10.20 × 21.02 × 2.48	2.1	4.63
5	45 763	534 × 303.5 × 63	11.95 × 21.02 × 2.48	2.3	5.07
6	45 764	534 × 348.0 × 63	13.70 × 21.02 × 2.48	2.5	5.51
7	45 765	534 × 392.5 × 63	15.45 × 21.02 × 2.48	2.7	5.95
8	45 766	534 × 437.0 × 63	17.20 × 21.02 × 2.48	2.8	6.17
9	45 767	534 × 481.5 × 63	18.96 × 21.02 × 2.48	3.0	6.61
10	45 768	534 × 526.0 × 63	20.71 × 21.02 × 2.48	3.2	7.05
11	45 769	534 × 570.5 × 63	22.46 × 21.02 × 2.48	3.3	7.28
12	45 770	534 × 615.0 × 63	24.21 × 21.02 × 2.48	3.5	7.72
14	45 772	704 × 534.0 × 63	27.72 × 21.02 × 2.48	3.8	8.38
16	45 774	793 × 534.0 × 63	31.22 × 21.02 × 2.48	4.1	9.04

Important notice: Inside diameter housing frame = external dimension minus 2.13" (54 mm).

→ Stacking diagram



Cable coil



- Depending upon U: set comprising 2 to 4 retention brackets with Velcro tape.

Bag



- Outer dimensions, small bag: approx. 7.28 × 5.31 × 1.97" (185 × 135 × 50 mm).
Order No. 322 768
- Outer dimensions, large bag: approx. 16.93 × 9.92 × 1.97" (430 × 252 × 50 mm). Possible from 7U.
Order No. 340 934

Keyboard support



- Foam insert in the lid, secured by Velcro tape. Possible from 6U.

Louvered panel



- Measurements approx. 9.06 × 4.72" (230 × 120 mm), 5-louvered.
Order No. 334 699
- Effective ventilator cross-section 10.2 in² (6600 mm²).
- Other measurements please inquire.

Lock installation



- Cylinder lock. 2 locks diagonal to 2 toggle locks with 2 keys.

Pressure equalisation



- Automatic to VG 95 618.
Order No. 316 886



- Manual.
Order No. 320 060



- Screw.
Order No. 346 457

- Decompression opening on request (without picture).

Humidity control



- Humidity indicator according to TL 6685-0008 (VG 95 617).
Order No. 316 887
- Desiccant available upon request.

Equipment mounting angles



- Riveted in.
- Infinitely adjustable, secured with a screw.

For crane transport



- Rivet nuts (complete set of 4) and lifting eyes (M8).

RF-Screening



For housings with lids fitted:

- This is achieved by using a special lid gasket.
- Cutout with RF honeycomb filter. Sealing to IP 54. Mainly for installation in the lid.



For housings without lids fitted:

- By fitting aluminum infill panels on 4 sides of frame. Optionally perforated for better circulation of the air. In addition, the front and back of the frames are fitted with an RFI Gasket. Measured values for this see page 11.
- By fitting a flexible skirt seal made from conductive material between the housing and the frame. Front panel and rear panel must be adapted by the user so that they are RF-shielded.



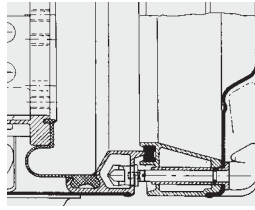
Shielding Effectiveness Measurement.



Flexible environmental seal



- If IP 65 is required in operation with an open lid, skirt seals are to be used in accordance with the table below.
- RF-screened version available as special equipment.



Order No.	for Mitraset® type
37 053	3 HE/U
37 054	4 HE/U
37 055	5 HE/U
37 056	6 HE/U
37 057	7 HE/U
37 058	8 HE/U
37 059	9 HE/U
37 060	10 HE/U
37 061	11 HE/U
37 062	12 HE/U
37 064	14 HE/U
345 093	16 HE/U

Fitting / installation



- Is done by fitting threaded (M8) inserts into the stacking feet.

Deployable leg kit



- Variable height adjustment. With 3 or 4 legs. With the legs removed, the stand can be stacked with housings, complete with captive fixing elements. For all sizes from nominal depth of 13.78" (350 mm).

Special lid



→ With laser-cut holes for switches and plugs to customer's specification.

Telescopic rails



→ Cover possible.
→ With telescopic rails.
→ Suitable for drawers, trays, etc.

Special lid with flap



→ Size of the opening variable according to size of lid.



Further accessories

→ e.g. transport aids, housing connections, side panels, hinged lids, etc., are available upon request.



Cooling

Cooling in watts under differing operational conditions

Inner height	Nominal depth mm	Nominal depth inch	Single housing, free-standing (1) Watt	Rear-wall, attached (2) Watt	Housing in the middle of the stack (3) Watt
3 HE/U	219	8.62	72	59	46
	350	13.78	86	73	53
	480	18.90	100	87	59
	610	24.02	114	101	65
4 HE/U	219	8.62	82	66	56
	350	13.78	97	81	63
	480	18.90	112	97	71
	610	24.02	128	112	79
5 HE/U	219	8.62	91	73	65
	350	13.78	108	90	74
	480	18.90	124	106	83
	610	24.02	141	123	92
6 HE/U	219	8.62	101	80	75
	350	13.78	119	98	85
	480	18.90	137	116	95
	610	24.02	155	134	106
7 HE/U	219	8.62	110	87	85
	350	13.78	130	106	96
	480	18.90	149	125	108
	610	24.02	168	145	119
8 HE/U	219	8.62	120	94	94
	350	13.78	141	114	107
	480	18.90	161	135	120
	610	24.02	182	155	133
9 HE/U	219	8.62	130	101	104
	350	13.78	151	123	118
	480	18.90	173	144	132
	610	24.02	195	166	146
10 HE/U	219	8.62	139	108	113
	350	13.78	162	131	129
	480	18.90	185	154	144
	610	24.02	209	177	160
11 HE/U	219	8.62	149	115	123
	350	13.78	173	139	140
	480	18.90	198	164	156
	610	24.02	222	188	173
12 HE/U	219	8.62	158	122	133
	350	13.78	184	147	151
	480	18.90	210	173	169
	610	24.02	236	199	187
14 HE/U	610	24.02	263	220	214
16 HE/U	610	24.02	290	242	241



Details

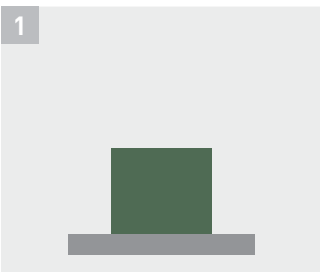
The guide figures calculated in the table may be influenced by various factors, eg:

- Paint type and color.
- Internal air circulation.
- Location and position of the housing.
- Influencing factors due to adjacent cases.
- Weather and climatic conditions.
- The guide figures in the table have been calculated for ΔT 36 °F (20 °C), figures in W. (All figures for closed housings.)

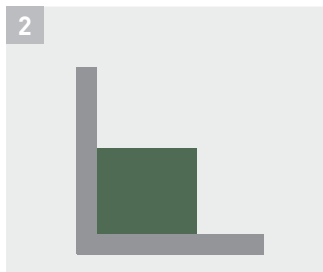
Note:

Thanks to the special slide-in ventilation modules and heat exchangers, cooling can be adjusted to suit individual requirements.

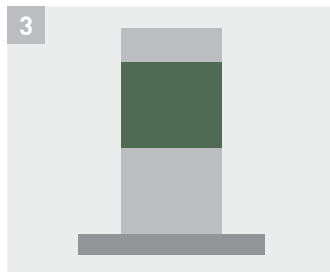
Single housing, free-standing



Rear-wall, attached



Housing in the middle of the stack



Heating and Cooling Equipment



Heating/cooling unit in frame

If the heat dissipation of the Mitraset housing is not adequate, the cooling capacity can be increased by means of an active cooling unit. Depending on the requirement, these items of equipment can also be used for heating the housing.

Details

- The heating/cooling unit can be accommodated in the lid, in the frame or on the housing as required.
- Possible cooling capacity depending on requirement up to 730 W.
- Max. ambient temperature range from -22 °F to 140 °F (-30 °C to +60 °C).
- Other variations please inquire.

Heating/cooling unit in housing



Mitraset® 19" Housings

Special Dimensions



Mitraset with Wire Rope Shock Absorbers:

- For particularly high loads or for particularly high vibration demands, the 19" frame featured on this variant is suspended on wire rope shock absorbers arranged at an angle of 45°:
The external dimensions have been increased due to size of the sway space.

Mitraset 1/2 19" Housing:

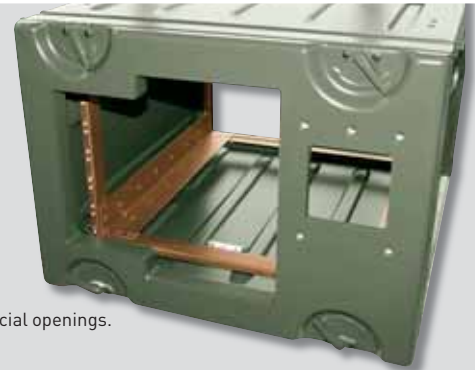
- For 1/2 19" racks ZARGES can supply a housing with one or two lids. rack width: 9.31" (236.5 mm).



Applications and Special Solutions



Housing with special frame.



Lids with special openings.



Customer-specific front panel with flexible skirt seal.



Housing with hinged lid and special dolly trolley.



Housing with special edge reinforcements.



Lid with connection panel for plug-in cable connections.



Mitrasets with interlocking latches.