

# HRU-90

## VENTILATION UNIT WITH VERY HIGH EFFICIENCY AIR-TO-AIR HEAT RECOVERY



### SERIES

HRU-90 line consists of 7 models, from 300 m<sup>3</sup>/h up to 5.400 m<sup>3</sup>/h. Also available in many arrangements.

The high static pressures allow the assembling of canalizations to extract or intake air in many ambients.

### FIELD OF APPLICATION

- Self-supporting body with 25 mm (42 mm mod. 500) thickness sandwich panels, galvanized steel sheet metal inner skin, pre-coated steel sheet metal outer skin RAL 9002
- Non-flammable mineral wool thermal and acoustic insulation
- Very high efficiency counterflow heat recovery, aluminium heat exchanger plates with supplementary sealing and built-in motorized by-pass device; aluminium drain pan, fitted with 1/2" M condensation outlet (on side for horizontal unit, on bottom for vertical unit)
- Compact filters at both intakes with synthetic (external layers) and micro-glass (intermediate layer) media and galvanized steel frame, ISO ePM10 50% efficiency class on return air, ISO ePM1 50% efficiency class on fresh air, easily removable from bottom and side panels; efficiency according to ISO 16890.
- Air filter pressure switches wired to the unit control panel for air filter clogging control.
- Direct driven EC motor plug fans; plastic fiberglass-reinforced impeller or aluminium
- Built-in electric box with electronic controller for a complete control of all typical functions of the unit; in particular :
  - manual control of EC fan motors
  - automatic control of EC fan motors (by pressure, temperature or air quality sensor)
  - heating/cooling water valve modulating control
  - electric heater on/off control (both pre and re-heater)
  - heat recovery defrost control
  - free-cooling on/off mode control
  - post-ventilation
  - weekly programming
  - alarm management and dirty filter warning
  - remote on/off
  - remote Summer/Winter mode
  - EC fan motors management by fire alarm digital input
  - BMS by Modbus protocol and RS485 connection



### TECHNICAL DETAILS

- Conveyed air: clean
- Voltage:
  - three-phase version (T) 400 - 415V - 3Ph - 50Hz
  - single-phase version (M) 230 - 240V - 1Ph - 50Hz

### OPTIONALS

- IEH:** Electric heater
- WSC:** Water heating/cooling external section
- 3W:** 3-way modulating valve
- SR:** Adjusting damper
- SSR:** Damper actuator
- GA:** Flexible connection
- AC:** Round connection
- SPD:** Differential pressure transducer
- AQS:** Ductable CO<sub>2</sub> transducer
- RC:** Roof covers

### ON DEMAND

- **HRU-90:** Vertical installation
- Special voltage and frequency

<b>VENTILATION</b>			<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>
Airflow rate	Nom	m <sup>3</sup> /h m <sup>3</sup> /s	380 0,106	720 0,200	1130 0,314	1710 0,475	2460 0,683	3300 0,917	4500 1,25
External static pressure <sup>(1)</sup>	Nom	Pa	300	205	220	250	220	270	470
1m sound pressure level	Nom	dB(A)	54	53	51	59	59	60	64
Overall power input	Nom	W	340	340	730	930	1650	1920	3050
	Max		340	340	920	930	2000	2000	4850
Overall input current	Nom	A	2,8	2,9	5,0	6,0	2,9	3,4	4,8
	Max		2,8	2,9	6,0	6,0	3,4	3,5	7,6
Power supply		V-Ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	400-3+N-50	400-3+N-50	400-3+N-50
Fan speed control		-	0÷10V						
External leakage			max 3,5% @ - 400 Pa (EN 13141-7)						
Internal leakage		%	max 5,5% @ +250 Pa (EN 13141-7)						
Yearly filter energy consumption <sup>(5)</sup>		kWh	420	670	1200	1700	2085	2787	3180

<b>HEAT RECOVERY</b> <sup>(2)</sup>		<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>
Recovery efficiency	%	92,1	91,7	91,7	91,5	90,7	90,8	89,4
Recovery capacity	W	3490	6570	10450	15600	22280	29920	35200
Supply temperature	°C	17,6	17,5	17,5	17,5	17,2	17,2	17,1

<b>CONFORMITY TO EU 1253/2014</b>		<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>
Recovery efficiency <sup>(3)</sup>	%	83,8	82,8	82,4	82,0	81,4	81,5	82,9
Efficiency bonus	W/m <sup>3</sup> /s	324	294	282	270	252	255	297
Filter correction factor	-	0	0	0	0	0	0	0
SFP int limit	W/m <sup>3</sup> /s	1408	1364	1335	1299	1249	1217	1209
Total internal air pressure drop <sup>(3)</sup>	Pa	621	699	645	595	702	718	615
Overall fan static efficiency <sup>(4)</sup>	%	44,3	53,7	48,9	50,3	57,6	59,2	62,0
SFP int	W/m <sup>3</sup> /s	1403	1301	1319	1183	1219	1213	992

<b>WORKING LIMITS</b>		<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>
Air temperature	°C	-20 ÷ 45						
Air relative humidity	%	10 ÷ 95						
Working environment	-	Not explosive, not corrosive, not chlorinated, not saline						

(1) Fresh air/supply air circuit

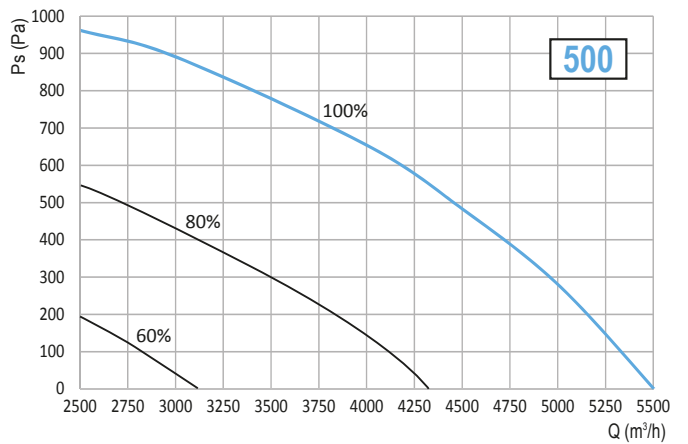
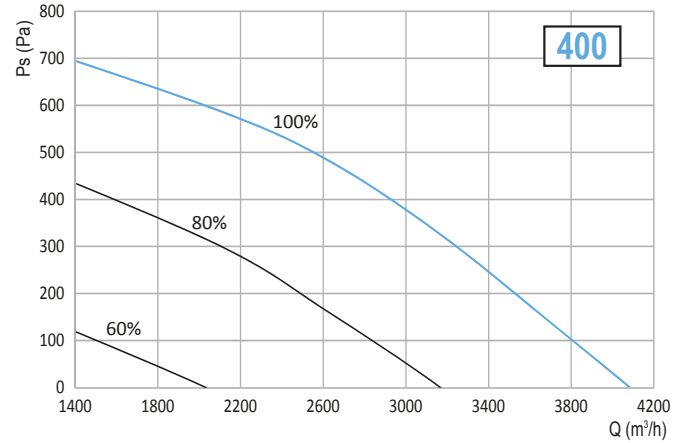
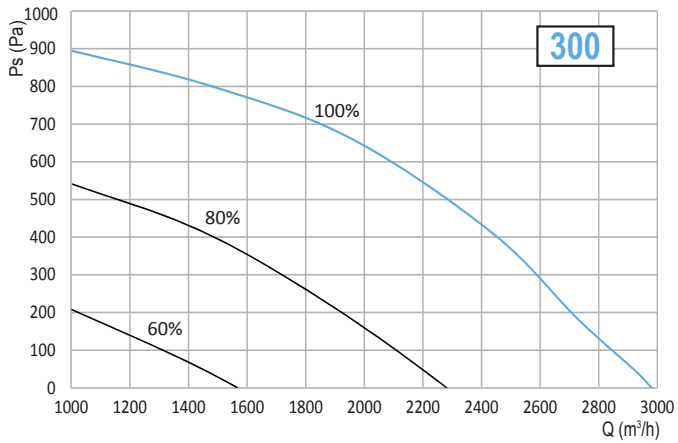
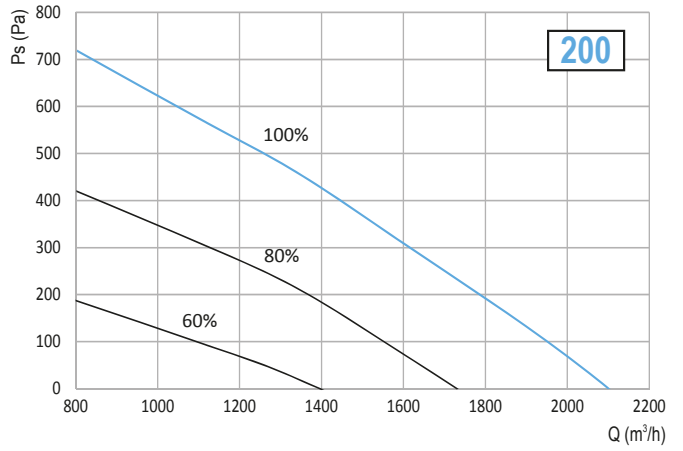
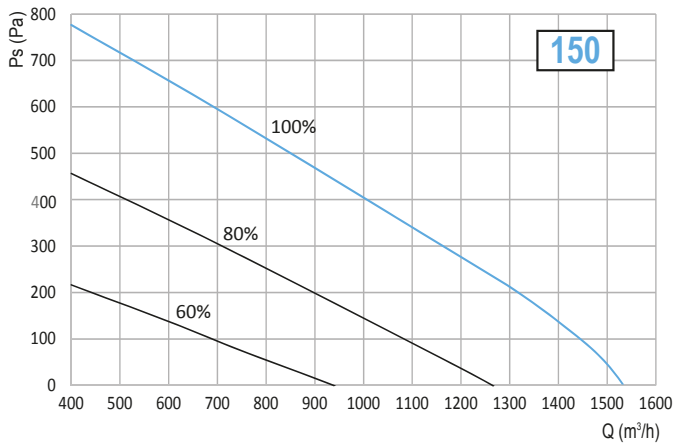
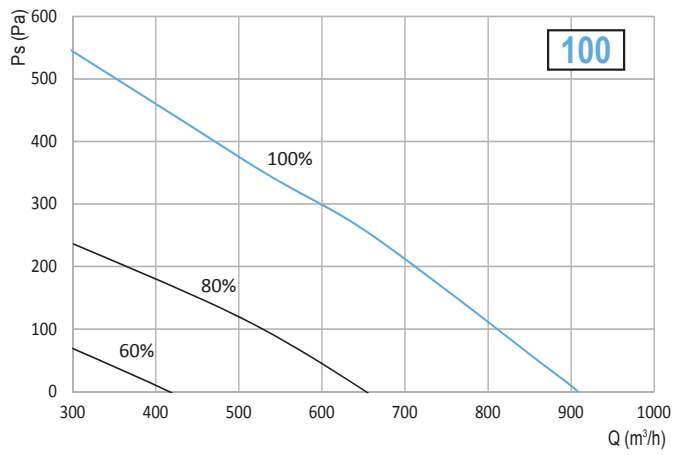
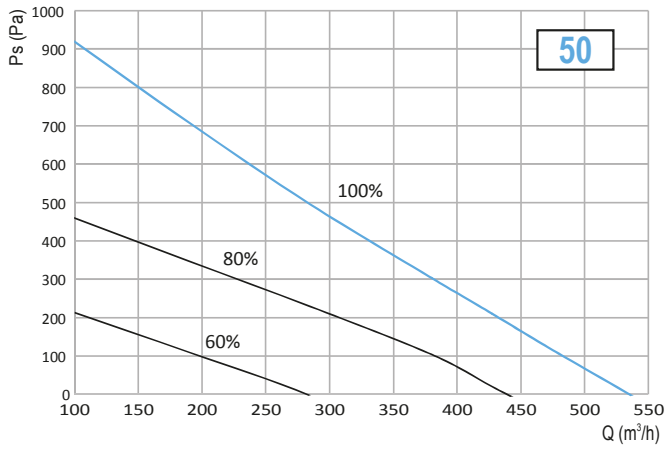
(2) At wet conditions : outside air temperature -10°C 90% RH, room air temperature 20°C 60% RH

(3) At dry conditions : outside air temperature 5°C, room air temperature 25°C

(4) Including motor & speed controller efficiency

(5) Based on 6000 operating hours per year at nominal airflow rate, at fan efficiency (4) and on 150 Pa max air filter pressure drop before replacing (both M5 and F7 filter)

# HRU-90 Performances



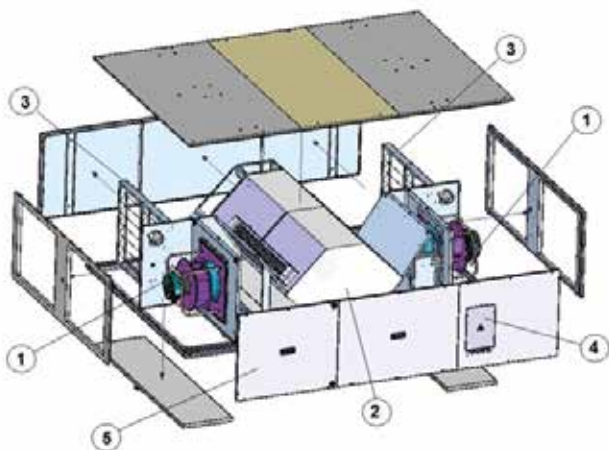
## HRU-90 Noise level

Referring to nominal working conditions, the following table shows the sound power level (SWL) per octave band and total; It also shows the sound pressure level (SPL) at 1m, 5m and 10m on supply air, return air and outside the unit connected to air ducts.

MODEL	SWL [dB] per octave band [Hz]								SWL		Supply SPL			Return SPL			Outside SPL		
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	1 m	5 m	10 m	1 m	5 m	10 m	1 m	5 m	10 m
	dB(A)																		
50	62	59	65	65	63	63	62	53	72	69	61	47	41	53	39	33	44	30	24
100	61	58	64	64	62	62	61	53	71	68	60	47	41	53	39	33	44	30	24
150	60	59	65	65	63	63	63	55	72	70	61	48	42	54	40	32	45	31	25
200	66	64	74	73	69	68	68	67	79	76	68	54	48	60	46	40	51	37	31
300	69	66	74	76	72	71	67	67	80	77	69	55	49	61	47	41	52	38	32
400	68	69	72	73	69	70	66	65	79	76	68	54	48	60	46	40	51	37	31
500	70	68	80	75	70	70	67	70	83	79	72	58	52	64	50	44	55	41	35



## HRU-90 Spare parts



- 1 – Supply and exhaust EC fan
- 2 – High efficiency air-to-air heat recovery with built-in motorized by-pass device
- 3 – Air filter close to air inlet (class efficiency: F7 on fresh air, M5 on return air)
- 4 – Built-in electric box complete with controller (and remote user interface)
- 5 – Self-supporting panels

IEH	INTERNAL ELECTRIC HEATER	Model u.m	50	100	150	200	300	400	500
	Capacity	kW	1,5	2,5	4,0	5,0	7,5	10,5	12,5
	$\Delta T^{(1)}$	°C	9,8	9,2	9,5	7,7	7,9	8,1	8,1
	Air pressure drop <sup>(1)</sup>	Pa	5	6	10	10	11	12	12
	Power supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	400-3-50	400-3-50	400-3-50

<sup>(1)</sup> at nominal airflow rate

WCS	WATER ESTERNAL SECTION	Model u.m	50	100	150	200	300	400	500
	Cooling capacity <sup>(1)</sup> total sensible	kW	2,46	4,47	6,65	10,62	16,14	20,68	26,29
			1,35	2,41	3,66	5,84	8,72	11,37	14,20
	Heating capacity <sup>(2)</sup>	kW	3,30	5,86	9,08	12,97	20,83	27,50	33,36
	Water flow rate <sup>(1)</sup>	l/h	432	756	1152	1836	2772	3564	4500
	Water pressure drop <sup>(1)</sup>	kPa	12	18	9	13	19	15	33
	Air pressure drop <sup>(3)</sup>	Pa	51	53	51	50	50	55	54
	Weight	kg	28	31	35	42	52	58	77

<sup>(1)</sup> Air inlet condition 28,0°C 60% RH; in/out water temperature 7°/12°C

<sup>(2)</sup> Air inlet condition 13°C; in/out water temperature 45°/40°C

<sup>(3)</sup> at nominal airflow rate

AC	ROUND CONNECTION	Model u.m	50	100	150	200	300	400	500
	Diameter	mm	250	315	315	400	500	500	596
	Connection strip	mm	100	100	100	100	100	100	100
	Air pressure drop <sup>(1)</sup>	Pa	7	7	16	10	9	16	12

<sup>(1)</sup> at nominal airflow rate

SR	SERRANDA REGOLAZIONE - ADJUSTING DAMPER	Model u.m	50	100	150	200	300	400	500
	Air dimensions L x H	mm	250 x 230	290 x 270	370 x 355	610 x 355	610 x 490	770 x 490	810 x 720
	Weight	kg	1,6	2,1	2,6	3,7	4,3	6,2	8,1

### SSR DAMPER ACTUATOR

230V 50 Hz on/off type, already mounted on damper shaft; 2 Nm torque and 1,5 W power consumption.

### GA FLEXIBLE CONNECTION

It allows the flexible connection between the basic unit or its possible external sections and the air ducts, to cut off the transmission of the mechanical vibrations due to the mobile parts of the unit. Their dimensions are the same of the corresponding SR

### SPD DIFFERENTIAL PRESSURE TRANSDUCER

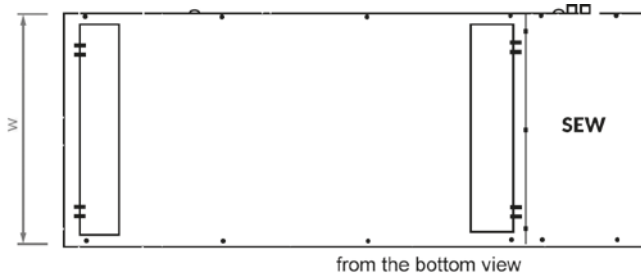
Differential pressure sensor for constant airflow control. It is delivered already mounted and wired on the basic unit.

### AQS DUCTABLE CO<sub>2</sub> TRANSDUCER

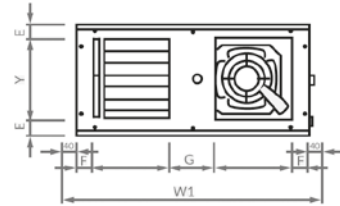
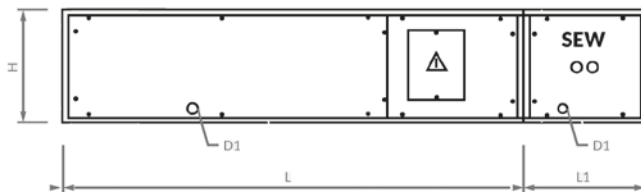
CO<sub>2</sub> sensor, ductable type, to be placed on the return duct, it allows a continuous modulation of the airflow, based on air quality desired level

# HRU-90 Dimensions

## HRU-90 Horizontal unit



SEW: accessory

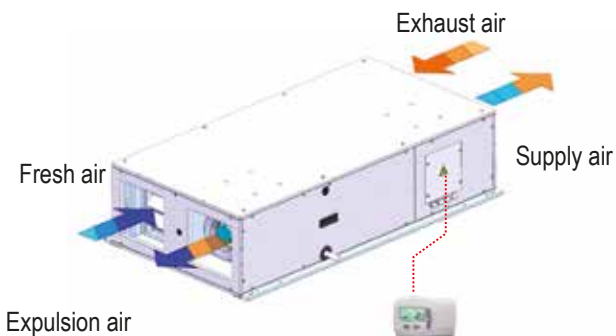


Model	50	100	150	200	300	400	500
L	1350	1470	1850	1850	2150	2150	2350
W	680	820	1030	1460	1460	1840	1900
H	330	370	455	455	590	590	800
W1	760	900	1110	1540	1540	1920	1980
X	230	300	390	600	590	780	800
Y	225	265	350	350	485	485	720
E	52,5	52,5	52,5	52,5	52,5	52,5	40
F	46	46	46	46	55	55	40
G	128	130	158	170	170	170	220
D1	1/2" M	1/2" M	1/2" M	1/2" M	1/2" M	1/2" M	1/2" M
D2	3/4" M	3/4" M	3/4" M	3/4" M	1" M	1" M	1" M
L1	350	400	400	400	502	502	535
Weight <sup>(1)</sup> Kg	86	106	181	236	297	367	520

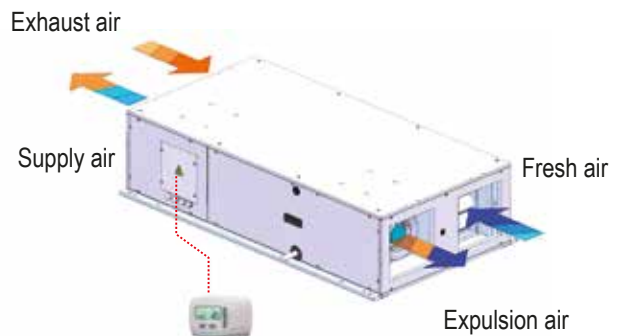
<sup>(1)</sup> basic unit - Dimensions in mm

# HRU-90 Arrangements

## TYPE: A

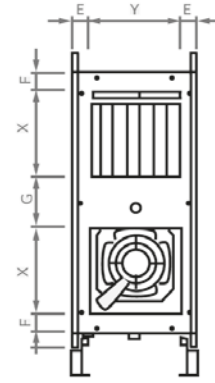
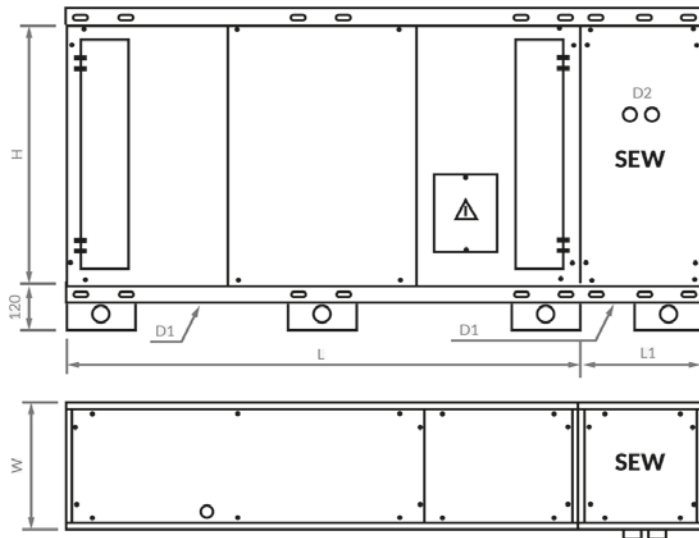


## TYPE: B



# HRU-90 Dimensions

## HRU-90 Vertical unit



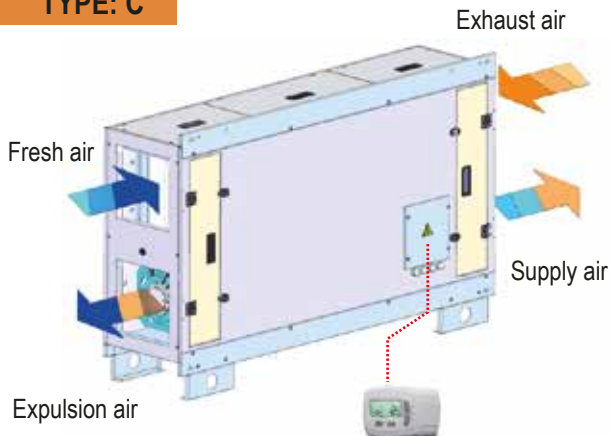
**SEW:** accessory

Model	50	100	150	200	300	400	500
<b>L</b>	1350	1470	1850	1850	2150	2150	2350
<b>W</b>	330	370	455	455	590	590	800
<b>H</b>	680	820	1030	1460	1460	1840	1900
<b>X</b>	230	300	390	600	590	780	800
<b>Y</b>	225	265	350	350	485	485	720
<b>E</b>	52,5	52,5	52,5	52,5	52,5	52,5	40
<b>F</b>	46	46	46	46	55	55	40
<b>G</b>	128	130	158	170	170	170	220
<b>D1</b>	1/2" M	1/2" M	1/2" M	1/2" M	1/2" M	1/2" M	1/2" M
<b>D2</b>	3/4" M	3/4" M	3/4" M	3/4" M	1" M	1" M	1" M
<b>L1</b>	350	400	400	400	502	502	535
<b>Weight <sup>(1)</sup> Kg</b>	86	106	181	236	297	367	520

<sup>(1)</sup> basic unit - Dimensions in mm

# HRU-90 Arrangements

## TYPE: C



## TYPE: D

