Flat solar collector

SOL 200 and SOL 200 H

Flat solar collectors for thermal solar collection facilities. Sol 200 vertical mounting, Sol 200 H horizontal mounting.

Features

- Aluminum absorber plate highly selective surface treatment, hydraulic circuit connected to the coil of copper tube by laser welding.
- Textured glass cover of 3.2 mm, tempered low iron content.
- Insulation glass wool 40 mm thick, which is supported by the aluminum plate back.
- Aluminum housing painted gray RAL 7016.
- Four connections for the connection between manifolds through easy mounting accessories.
- Tested by CENER
- 10 YEAR WARRANTY.

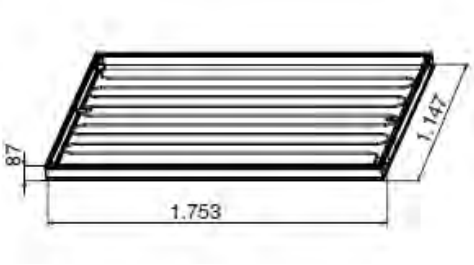
Type of delivery

a package type:
SOL 200 Solar Collector
Code 720 364 001
- Collector SOL 200 H
Code 720364301

Dimensions and Technical Data

SOL 200

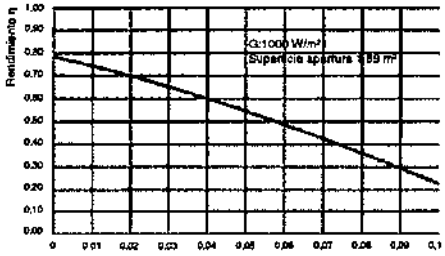
SOL 200 H



		SOL 200	SOL 200 H
Total Surface		2,01 m²	2,01 m²
Opening surface		1.89m²	1,89 m²
Capacity:		1 ,9 liters	2.2 liters
Weight empty		34,3 kg	35 kg
Maximum pressure	working	10 bar	10 bar
Temperature		**213 °C**	211 °C

Yield Curve

SOL 200



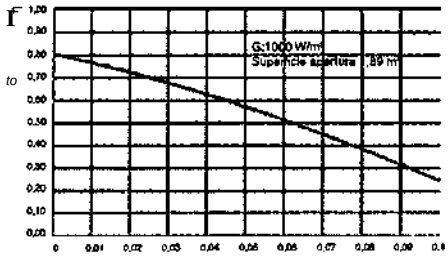
$T^* = \frac{Tm - Ta}{G} \left(\frac{°C\,m^2}{W}\right)$

Manifold characteristic equation

$\eta = 0{,}785 - 4{,}046\ T^* - 0{,}018\ G\ T^{*2}$

Tm - Average temperature of the collector. Room temperature Solar
Ta
G - irradiance
Test performed by CENER

SOL 200 H



$T^* = \frac{Tm - Ta}{G} \left(\frac{°C\,m^2}{W}\right)$

Manifold characteristic equation

$\eta = 0{,}801 - 3{,}810\ T^* - 0{,}018\ G\ T^{*2}$

Tm - Average temperature of the collector. Room temperature,
Ta
G - Solar Irradiation
Test performed by CENER

Detail collector section

1. Tempered glass.
2. Painted aluminum housing.
3. Selective coating absorber plate.
4. 40mm insulation fiberglass back.
5. Hydraulic circuit coil type.

Flat solar collector

Sun joints for solar collectors

Solar collectors SOL are designed
to be installed in a manner in a box with all the components
easily and safely. The design of terminal
pipes allow use Links SOL solar collectors
quick connect couplings.
Couplings are suited to all
SOL collector models.

Set of couplings of two manifolds
Code 720297801
Coupling inter-game collectors set
Code 720239901

Position	Description	Two collectors Amount	Inter-manifolds Qty
1	Outlet connection collector probe sheath and manual air vent incorporated		
2	Bottle cap	2	
	Collector inlet connection elbow		
4	Link intercolector union	2	2
...5	Mounting clip for output connection, connection plugs and inlet elbow	4	

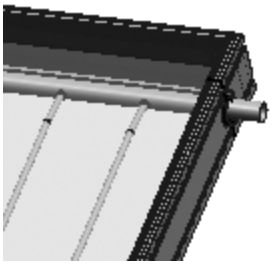
Joints para Mediterranian solar collectors

The couplings of solar collectors **Links solar collectors**
Mediterranean are based on **Mediterranean**
compression links conical pipe couplings
diam:. mm

set of two manifolds
Code 144940007
Coupling inter-game collectors **Form of**

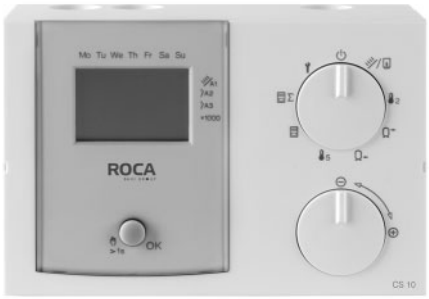
their minister Code 144940008
In a box with all the components

Position	Description	Two collectors Amount	Inter-manifolds Qty
1	Outlet connection collector probe sheath and manual air vent incorporated	1	
2	Plugs compression link 22 mm diam	2	
3	Collector inlet elbow connection with compression link 22 mm diam	1	
4	Clickable Link intercolector compression bonding diam 22 mm	2	2
5	Flexible 1m steel flat seam welding buttress 3/4 "x diam		



Electronic control

Controllers for hot-water systems with solar collectors



Solar Controller CS-10

It controls production of Domestic Hot Water of the solar energy system.
By means of a correct programming, this unit can guarantee maximum use of the solar energy received, can also monitor the back-up boiler selected.

Main features

- Solar collector temperature control.
- DHW storage cylinder temperature control.
- Solar pump operation control according to the solar collector and DHW cylinder temperature.
- Anti-legionella protection feature (with back-up boiler).
- Possibility of connecting a pulse counter.
- Bus connection capability.

Delivery

In a box containing 4 sensors mod. PT 1000 of 1 KOhm

Solar Controller CS 1

The controller permits regulation of a solar circuit comprising one or more rows of collectors.

Main features

- Zone valve control in buildings with individual cylinders, according to the DHW cylinder and solar circuit temperature.

Delivery

In a box containing 2 sensors mod. PT 1000 of 1 KOhm

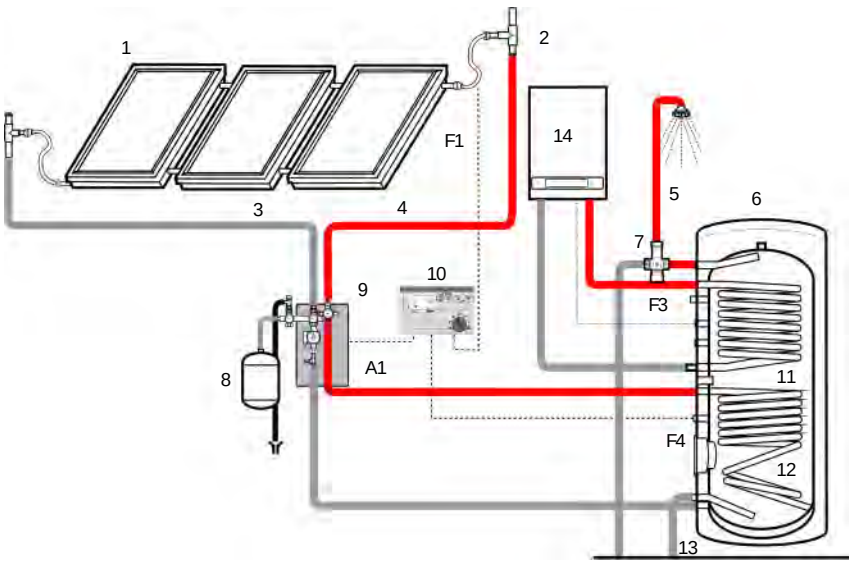
Technical data

Supply voltage.	230V AC ± 10%. 50Hz
Power input.	5VA
Relay switching capacity	250 V, 2 (2) A
Max. current at L1 terminal supplying L'	6,3 A
Electrical protection to DIN EN 60 529	IP 40
Protection class to DIN 60730	II
Timer battery back-up (only CS 10)	10 horas
Allowable room temp.	0 ° hasta 50 °C
Sensor resistors:	PT 1000, 1KOhm + / - 0,2% to 0 °C
Base for wall-mounting through rawlplugs and screws or making use of the guides attached to the lid for vertical fixing.	
Roughing-in measurements	143 mm long; 96 mm high and 59 mm deep

Diagram and basic circuit

Solar energy system schematic for Domestic Hot Water with a wall-mounted back-up boiler.

1 Solar collectors
2 Air vent
3 Solar collector flow
4 Solar collector return
5 Domestic Hot Water
6 Storage cylinder
7 Thermostatic mixing valve
8 Expansion vessel
9 Hydraulic kit KHS
10 Solar Controller
11 Back-up boiler heat exchanger
12 Solar collectors heat exchanger
13 Cold water inlet
14 Back-up heat generator (Wall-mounted gas boiler for Central Heating only)
F1 Solar collector sensor
F4 Cylinder sensor for interconnecting solar collectors
F3 Cylinder sensor for interconnecting back- up boiler
A1 Pump control



ASC Storage Cylinders

For Central Heating and Domestic Hot Water Systems with solar collectors

The new range of ASC cylinders is the optimal solution for combined applications of hot water production.

This new solution permits optimizing the available space and installation costs, thus obtaining maximum energy savings.
ASC 800/200 E and ASC 1000/250 E models consist of two separate cylinders. The main one – with the largest capacity – features a built-in coil heat exchanger fed by the heat-carrying fluid from the solar collectors. The secondary one – used for Domestic Hot Water production – also features a coil fed from a back-up heat generator.

The cylinders and heating coils are made from enamelled stainless steel. They are protected by an anti-corrosion sacrificial anode.

They are insulated with 100mm-thick polyurethane foam and enveloped by a PVC jacket finished in white RAL 9010.
5-year guarantee

Maximum working pressure:
(main cylinder): 3.5 bar

Maximum working pressure:
(secondary cylinder): 10 bar

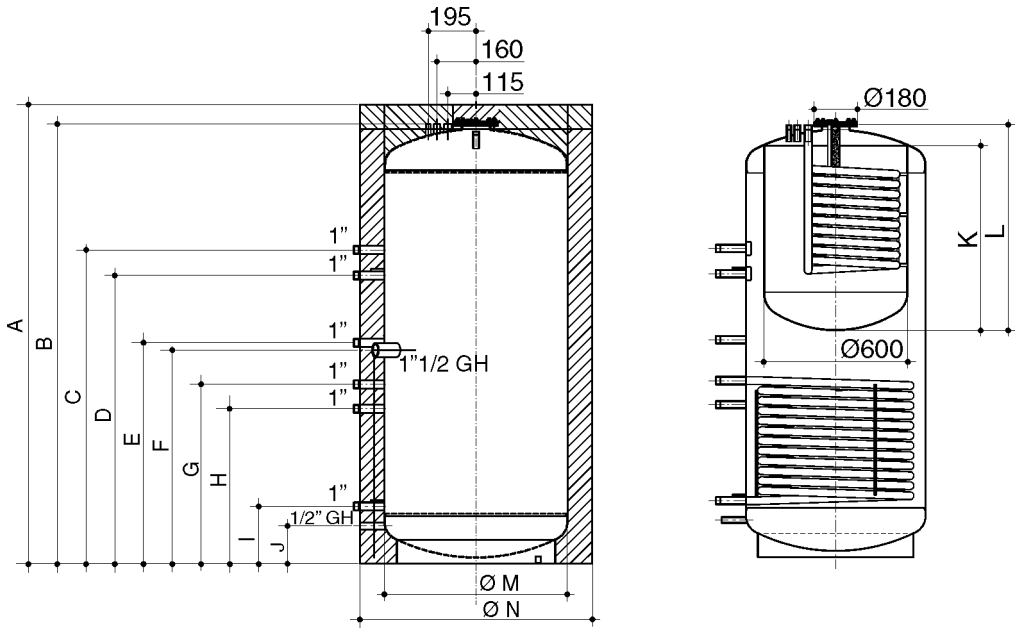
Maximum working temperature: 95 °C

Delivery

In a single package.

Dimensions and Technical Data

Models	Total cylinder capacity (l)	DHW cylinder capacity (l)	Overall height (mm)	Diameter (mm)	Weight empty (kg)	Weight filled (kg)	Heating surface (net) (m2)	Heating surface (gross) (m2)
ASC 800/200-E	750	200	1.880	650	200	950	1,20	2,40
ASC 1000/250-E	950	230	2.084	700	240	1190	1,30	2,40



Models	Dimensions mm													
	A	B	C	D	E	F	G	H	I	J	K	L	ØM	ØN
ASC 750 / 200 E	1880	1800	1285	1180	905	875	735	635	235	155	770	857	750	950
ASC 1000 / 250 E	2084	2010	1430	1330	1030	1000	780	680	280	170	870	954	790	990

Thermostates and equipment for control

Contact thermostat

Adjustment from 10 °C to 90 °C. Switched contact, 230 V. 15 A.
Fitted on the boiler water outlet pipe to act as contact thermostat.

Single immersion thermostat

Adjustment from 0°C to 90°C. Single-pole 230V. 10 A. Total length of pocket: 100 mm.
It controls the temperature of boiler water by acting on the burner.

Double immersion thermostat

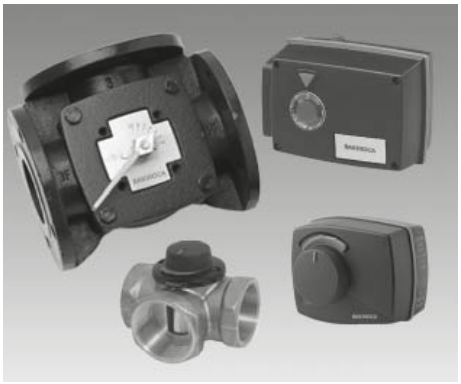
Double circuit. Switched contact for the control thermostat. It replaces two thermostats. Adjustment from 0 to 90 °C. Limiter adjustment from 90 °C to 110 °C with manual reset. 230 V. 10 A. It performs the operations of both a control thermostat and a limit thermostat.

Mixer valves

BAXIROCA

Three-way valve and servomotor

Valve and servomotor to control the water flow in Central Heating and primary Hot Water.



Main features

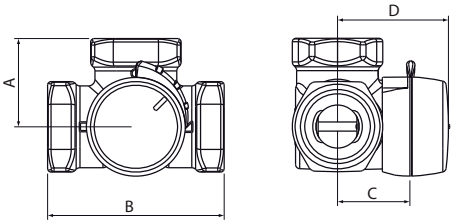
– Valves and Servomotors designed to be added to the control equipment.
– Possible control via a two-pole thermostat.
– The valve can be manually operated.
– Valve with brass (from 3/4" to 2") or iron (2 1/2" a 4") body and brass shutter.
– EPDM 'O' rings

Delivery presentation

In two packages:
- 3-way valve
- Servomotor SM-41 and connection kit (for valves up to 2")
- The Servomotor SM-81 includes a connection kit and an operating handle (for valves from 2½" to 4").

Dimensions and Technical Data

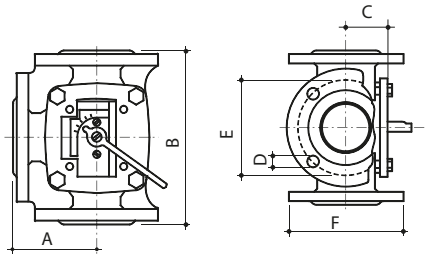
3-way valve
Max. operating temperature 110 °C



Threaded connections

ø thread	Dimensions mm			
	A	B	C	D
3/4"	36	72	32	50
1"	41	82	34	52
1 1/4"	47	94	37	55
1 1/2"	53	106	44	60
2"	60	120	46	64

Maximum working pressure: PN 10 bar

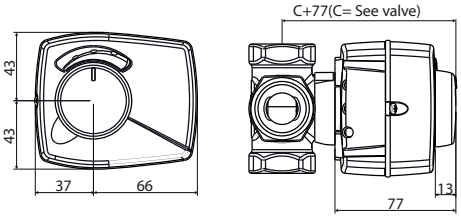


Flange connections (including the welding counterfl ange and the relevant fasteners).

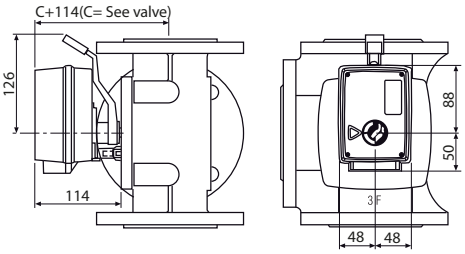
Model	Dimensions mm					
	A	B	C	D	E	F
2 1/2"	100,0	200	52	4 x 15	130	160
3"	120,0	240	63	4 x 18	150	190
4"	132,5	265	73	4 x 18	170	210

Maximum working pressure: PN 6 bar

Servomotor SM-41 with direct coupling for 3-way valves from 3/4" to 2"



SM-81 Servomotor for 3-way valves, 2 1/2" to 4"



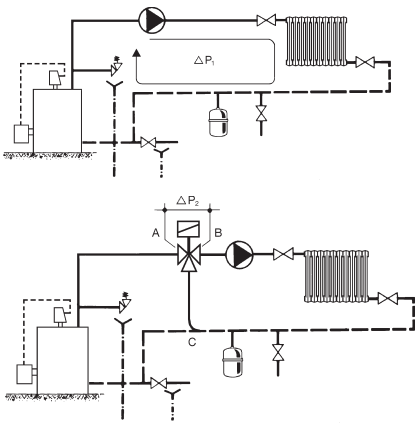
	SM-41	SM-81
Supply voltage	230 V	230 V
Power	5 VA	5 VA
Time to turn 90°C	120 sec.	120 sec.

Recommendations for selecting the 3-way valves

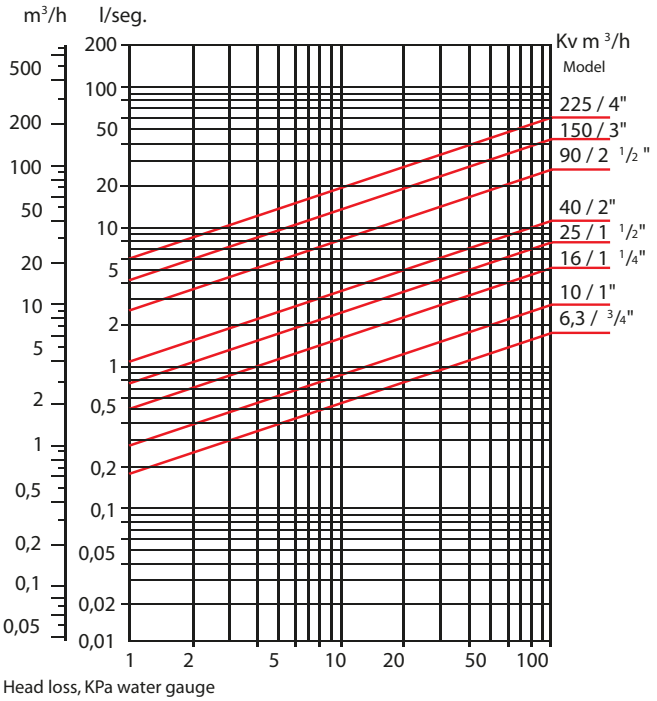
Three-way valves should be sized such that the pressure drop ranges between 10 and 30% of the system pressure drop.

$$\Delta P_2 = 10 \div 30\% \quad \Delta P_1$$

In addition, the following conditions should also occur:
1º- $\Delta P_1 + \Delta P_2 \leq$ Pump pressure.
2º- $\Delta P_{BC} \simeq \Delta P_{CA}$ (boiler circuit)
3º- ΔP_{CA} must be as small as possible (by-pass).



Valve size selection graph



Head loss, KPa water gauge
100 KPa = 1 bar = 10.000 mm.c.a.

Central heating circulation pumps

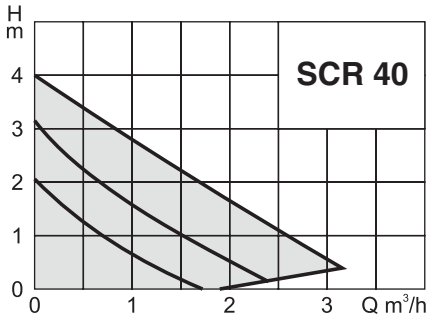
SCR 40 - SCR 60 - SCR 80

Technical data

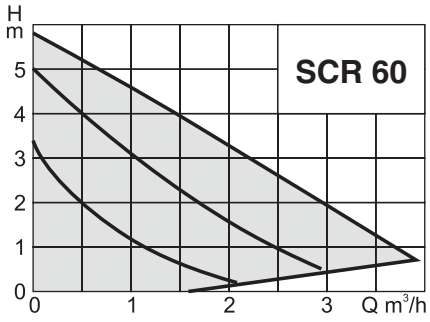
- single-phase motor with a wet rotor
- three rotational speeds
- operating voltage: 1 x 230 V~50 Hz
- max. operating pressure: 10 bar
- media temperature: 5°C to 110°C max.
- ambient temperature: 40°C max.
- protection type: IP 44
- connection: external thread GZ 1", 1 1/4", 1 1/2" (standard), 2"
- length: 180 mm (standard), 130 mm, 110 mm (brass)

The pump has been created to pump warm water in central heating systems, however it can be used to pump liquid media in industrial and commercial usage. The pump may also be a part of a solar heating installation.
The articles are manufactured from the highest quality cast iron and chrome-nickel steel, which guarantees that the products are of high quality. The product has a ceramic bearing ring and a rotor disk made of technical polymer.

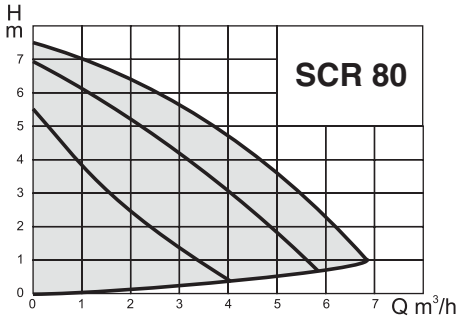
Pumps' characteristics



	I_N(A)	P_1(W)
Speed I	0,17	39
Speed II	0,26	60
Speed III	0,30	69

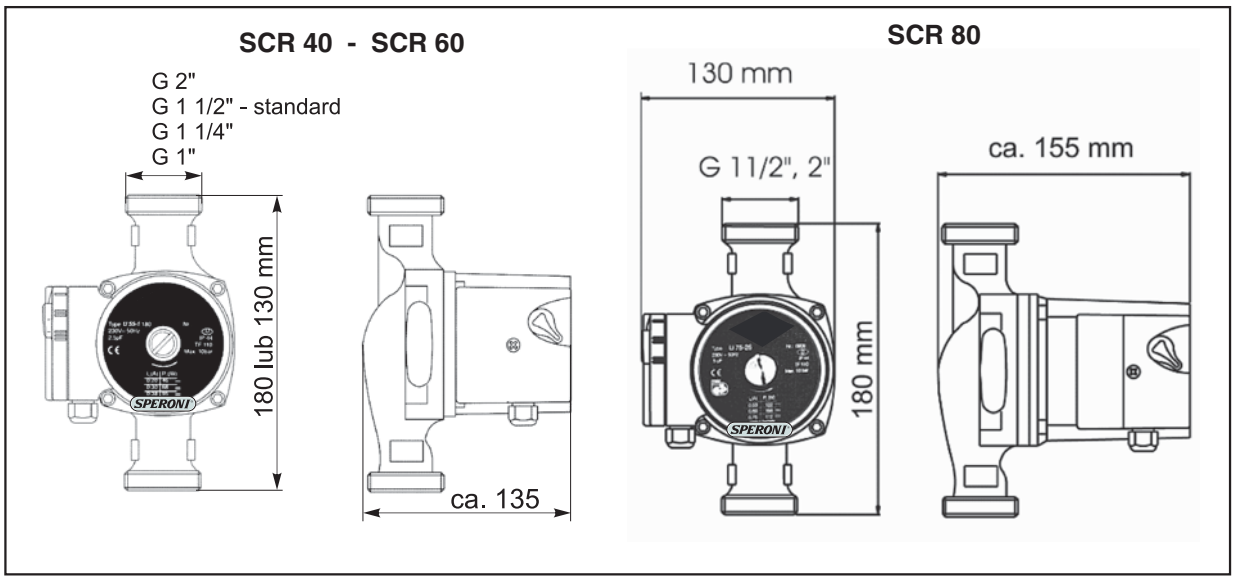


	I_N(A)	P_1(W)
Speed I	0,17	39
Speed II	0,27	62
Speed III	0,35	80



	I_N(A)	P_1(W)
Speed I	0,53	122
Speed II	0,69	159
Speed III	0,75	172

Dimension illustration



SCR 40

Article	Pump body	Length (mm)	DN	External thread	H(m)	Power consumption (W)
SCR 25/40-180	Cast iron	180	25	G 1 1/2 ”	4	28-63
SCR 15/40-130	Cast iron	130	15	G 1”	4	28-63
SCR 20/40-130	Cast iron	130	20	G 1 1/4”	4	28-63
SCR 25/40-130	Cast iron	130	25	G 1 1/2”	4	28-63
SCR 20/40-180	Cast iron	180	20	G 1 1/4”	4	28-63
SCR 32/40-180	Cast iron	180	32	G 2”	4	28-63

SCR 60

Article	Pump body	Length (mm)	DN	External thread	H(m)	Power consumption (W)
SCR 25/60-180	Cast iron	180	25	G 1 1/2 ”	6	39-80
SCR 15/60-130	Cast iron	130	15	G 1”	6	39-80
SCR 20/60-130	Cast iron	130	20	G 1 1/4”	6	39-80
SCR 25/60-130	Cast iron	130	25	G 1 1/2”	6	39-80
SCR 20/60-180	Cast iron	180	20	G 1 1/4”	6	39-80
SCR 32/60-180	Cast iron	180	32	G 2”	6	39-80

SCR 80

Article	Pump body	Length (mm)	DN	External thread	H(m)	Power consumption (W)
SCR 25/80-130	Cast iron	130	25	G 1 1/2 ”	8	122-170
SCR 32/80-130	Cast iron	130	32	G 2 ”	8	122-170
SCR 25/80-180	Cast iron	180	25	G 1 1/2 ”	8	122-170
SCR 32/80-180	Cast iron	180	32	G 2 ”	8	122-170

FLAMCOVENT Air Separator

Main features

Absorption Air Separator

The FLAMCOVENT Air Separator affords the ultimate solution to problems with in solar collector systems. The removal of air from solar collector systems is an all too familiar problem. Although automatic air vents are effective in the removal of larger air bubbles accumulating in the system, they are unable to eliminate micro-bubbles, normally invisible to the naked eye, which remain suspended in the water because they lack upward lift. These micro-bubbles stay in the circuit, causing:

- Noise.
- Accumulation in spots within the radiators and pipes where air venting becomes difficult.
  Difficulties in water circulation.
- Poor pump performance caused by cavitation.
  Damage to the impellers.
- Poor performance of boilers and heat exchangers.
- Corrosion.

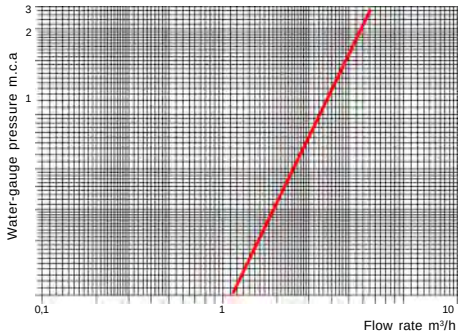
Models of 22 mm Ø

- Max. working pressure: 10 bar.
- Maximum temperature: 120 °C.
- Max. efficiency at water flow velocities up to 0.7 m/sec.
- In solar energy systems with a mixture of up 50% water/glycol.
- Delivered in individual cardboard boxes.

Working Principles

In addition to acting as a high-capacity automatic vent, the FLACOVENT air separator also eliminates the micro-bubbles suspended in the water. Its internal arrangement absobs these micro-bubbles, bringing them together and enbling them to rise into de upper chamber, where they are expelled. This leaves the water unsaturated and ready to absob more air from sections that are awkward to drain, taking that air to the FLACOVENT as well for elimination. **The FLAMCOVENT assures totally air-free water.**

Pressure Drop Graph

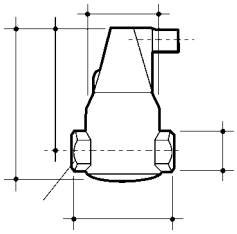


Installation

The FLAMCOVENT air separators provide their best perfomance when fitted at the point with the highest temperature and the lowest pressure in the system, which is where the water's air-absorption is lowest and thus where bubbles will apper.

Dimensions

Model	Dimensions in mm						Weight
	A	B	Ø C	Ø D	E	F	Kg
22 mm	151	116	68	22	121	36	1,4



Automatic Air Vent FLEXVENT SUPER 1/2"

Main features

Air vent including a float and a valve that acts automatically when the level of water drops and entrains air with it.

Screwed brass body in two halves. The air that has been separated accumulates at the top and is expelled through an outlet hole.

The float is located between both halves and allows the air to be expelled to pass through.

The tappings are ½".

- Max. working pressure: 10 bar.
- Maximum temperature: 120 °C.
- In solar energy systems with a mixture of up 50% water/glycol.

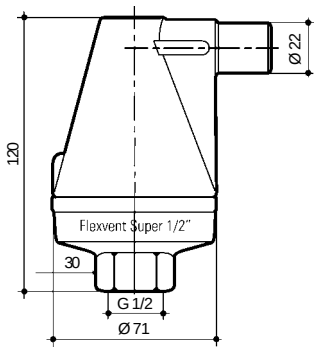
Delivery presentation

Delivered in individual boxes.

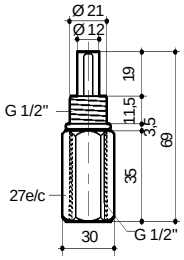
As an option, an isolating valve can be supplied to enable repairing or replacing the FLEXVENT SUPER air vent without draining the system.

Dimensions

FLEXVENT SUPER 1/2

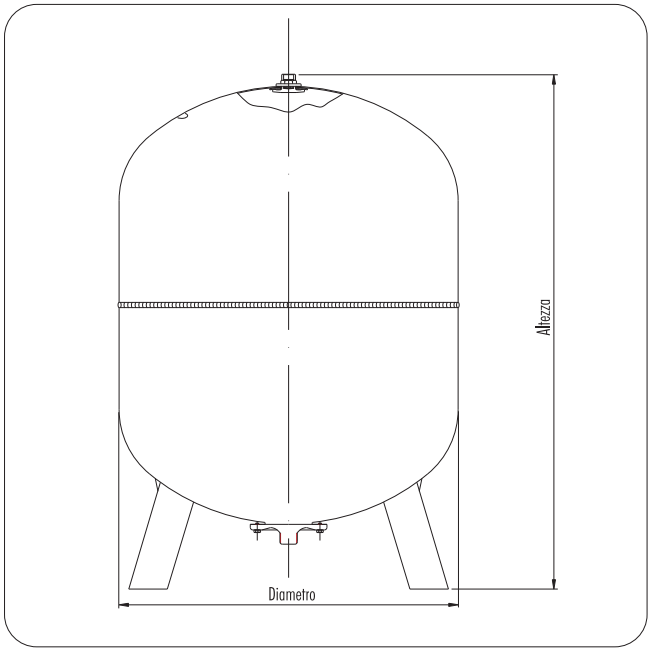


Isolating valve



AQUASYSTEM®
watertech

SERIE VRV



Utilizzo:	circuiti acqua calda, autoclave di pressurizzazione acqua calda
Use:	hot water circuits, pressurizing surge tanks
Utilisation:	circuites eau chaude, vase de pressurisation eau chaude

Temperatura d'esercizio Working temperature Température d'exercice	- 10° C +100° C
Finitura esterna colore External finish coulor Peinture externe	RAL 3000
Membrana in gomma Rubber membrane Vessie en gomme	EPDM

Modello Model Modèle	Codice Code Code	Altezza Height Hauteur (mm)	Diametro Diameter Diamétre (mm)	Lunghezza Lenght Longeur (mm)	Pressione massima d'esercizio Maximun working pressure Pression maximale d'exercice (bar)	Pressione di precarica standard Standard pre-loading pressure Pression de precharge standard (bar)	Imballo Packing Emballage L X H X P (mm)	Attacco Connection Raccordement (inch)
VRV35	AAJRE01R01DA1	450	365	-	8	1,5	(Pz1) 380X400X460	¾ "
VRV50	AAKRE01R01DA1	564	365	-	8	1,5	(Pz1) 380X400X570	¾ "
VRV60	AALRE01R01DA1	668	365	-	8	1,5	(Pz1) 380X400X700	¾ "
VRV80	AAMRE01R01EA1	687	410	-	8	1,5	(Pz1) 430X450X700	1 "
VRV100	AANRE01R01EA1	663	495	-	8	1,5	(Pz1) 510X540X700	1 "
VRV120	AAORE01R01EA1	733	495	-	8	1,5	(Pz1) 570X610X850	1 "
VRV150	AAPRE01R01EA1	795	550	-	8	1,5	(Pz1) 570X610X850	1 "
VRV200	AAQRE01R11EA1	1020	600	-	8	1,5	(Pz1) 620X630X1030	1"
VRV250	AARRE01R21EA1	986	650	-	8	1,5	(Pz1) 670X680X1290	1 "
VRV300	AASRE01R11EA1	1168	650	-	8	1,5	(Pz1) 670X680X1290	1 "
VRV400	AATRE01R21FA1	1093	750	-	8	1,5	(Pz1) 750X770X1510	1¼ "
VRV500	AAURE01R21FA1	1347	750	-	8	1,5	(Pz1) 750X770X1510	1¼ "
VRV600	AAVRE01R11FA1	1610	750	-	8	1,5	(Pz1) 750X800X1650	1¼ "

Vasi d'espansione a membrana intercambiabile
Expansion vessels with replaceable bladder
Vases d'expansion à vessie replaceable

Marcati CE secondo la Direttiva - CE marked according to Directive - Avec le marque CE selon la Directive
PED 97/23/CE

APPLICAZIONI

Elettropompe centrifughe monogiranti adatte a coprire richieste di piccole, medie e grandi portate.
Utilizzo in impianti domestici agricoli e industriali, distribuzione automatica dell'acqua per mezzo di piccoli serbatoi (autoclave), per irrigazione a pioggia e a scorrimento in giardino e agricoltura, per aumentare, in derivazione la pressione di rete degli acquedotti.

APPLICATION

Single impeller centrifugal pumps suitable to cover any small, medium or large capacity request; for domestic, agricultural and industrial purposes; with automatic water distribution through small and medium sized tanks; for sprinkler and flood irrigation systems in gardening and agriculture; to increase in derivation system pressure in aqueducts.

LIMITI D'IMPIEGO
- Temperatura liquido fino a 90°C
- Temperatura ambiente fino a 40°C
- Altezza d'aspirazione manometrica fino a 7 mt.
- Servizio continuo

MOTORE
- Motore elettrico ad induzione a 2 poli (n = 2850 min^{-1})
- Isolamento Classe F
- Protezione IP 55

MATERIALI

- Corpo pompa	Ghisa
- Supporto motore	Ghisa
- Girante	Ottone
- Albero motore	Acciaio Inox AISI 304
- Tenute meccaniche	Ceramica/Grafite/NBR

CM 35

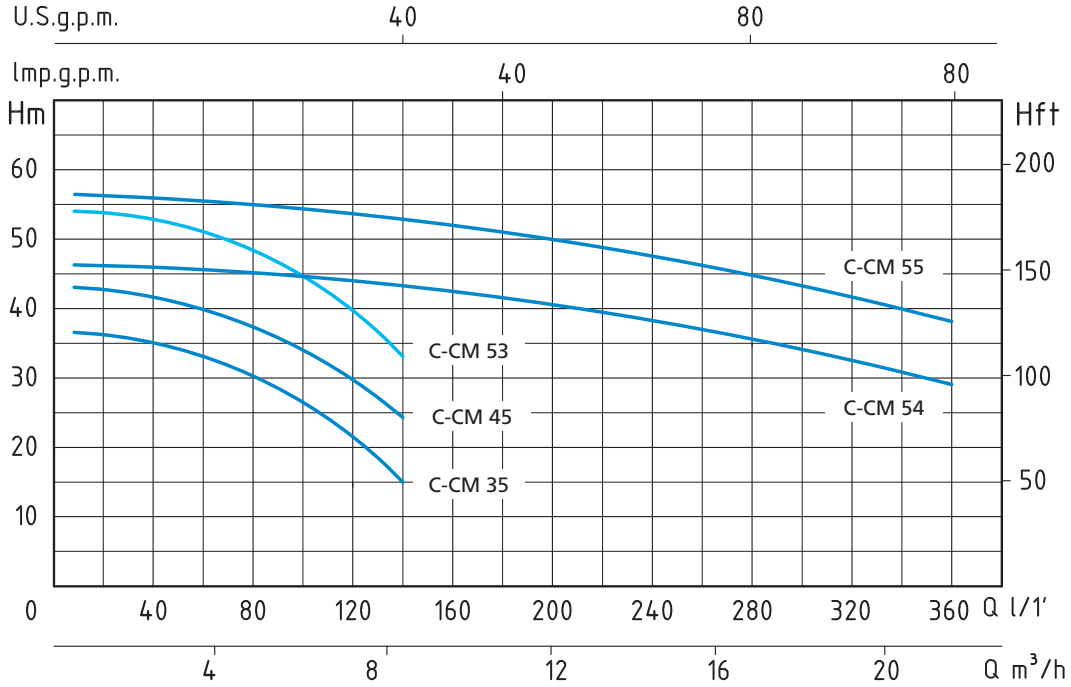
OPERATING CONDITIONS
- *Liquid temperature up to 90°C*
- *Ambient temperature up to 40°C*
- *Total suction lift up to 7 mt.*
- *Continuous duty*

MOTOR
- *Two-Pole induction motor (n = 2850 min^{-1})*
- *Insulation Class F*
- *Protection IP 55*

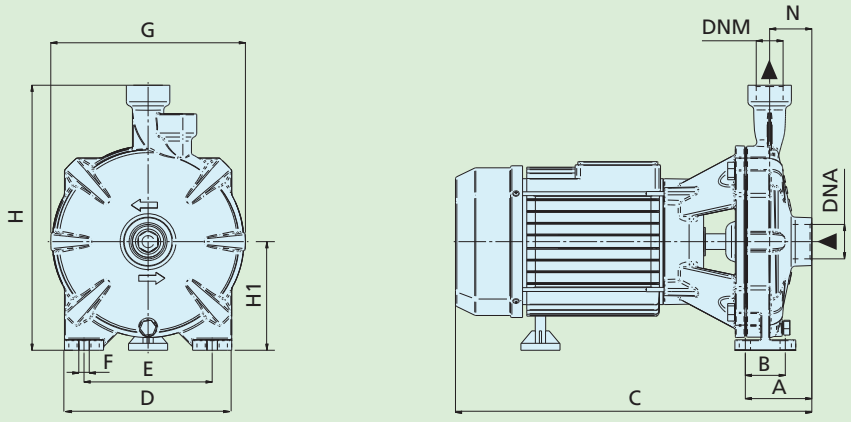
MATERIALS

- *Pump body*	*Cast Iron*
- *Motor Support*	*Cast Iron*
- *Impeller*	*Brass*
- *Shaft with rotor*	*Stainless Steel AISI 304*
- *Mechanical seal*	*Ceramic/Graphite/NBR*

CM 55



TIPO *TYPE*		POTENZA NOMINALE *NOMINAL POWER*		POTENZA ASSORBITA *INPUT POWER*	AMPERE		Q = PORTATA - *CAPACITY*										
Monofase *Single-phase*	Trifase *Three-phase*	P2		P1	Monofase *Single-phase*	Trifase *Three-phase*	m^3/h	0,6	1,2	3,6	5,4	6	7,5	9	12	18	21
		HP	kW	kW			lt/1'	10	20	60	90	100	125	150	200	300	350
230V-50Hz	230/400V-50Hz				1 x 230V	3 x 400V	Prevalenza manometrica totale in m.C.A. - *Total head in meters w.c.*										
CM 35	C 35	1,5	1,1	1,85	8,3	4	H (m)	36	35,5	33,5	28	26	19				
CM 45	C 45	2	1,5	2,4	10,7	5		43	42	40,5	36,5	34	28				
CM 53	C 53	3	2,2	3,3	15	5,5		54	53	51	47	45	38	29			
CM 54	C 54	4	3	4,5	20	7,3		46,5	46	45,3	44,7	44,5	44	43,5	42	35	
CM 55	C 55	5,5	4	5,7	28	9,3		56	55,5	54,5	54	53,5	53	52	50	44	39



TIPO *TYPE*		DIMENSIONI mm - *DIMENSIONS mm*												DIMENSIONI *DIMENSIONS* mm			PESO *WEIGHT*
Monofase *Single-phase*	Trifase *Three-phase*	A	B	C	D	E	F	G	H	H1	N	DNA	DNM	P	L	H	Kg
CM 35	C 35	76,5	45	355	220	147,5	12	224	305	125	48,5	1" ¼	1"	240	380	360	23
CM 45	C 45	76,5	45	410	220	147,5	12	224	305	125	48,5	1" ¼	1"	240	440	360	24
CM 53	C 53	76,5	45	410	220	147,5	12	224	305	125	48,5	1" ¼	1"	240	440	360	27
CM 54	C 54	88,5	60	485	245	190	14	256	323	132	58,5	2"	1" ¼	270	540	410	40
CM 55	C 55	88,5	60	475	245	190	14	256	323	132	58,5	2"	1" ¼	270	540	410	42