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## Magneto-electronic oil level regulator

with microprocessor and internal memory

## Refrigerant level sensor

with integrated relay and sight glass



## Oil and Refrigerant level management devices

The **IGLOO NOVO** magneto-electronic level regulator detects and controls the oil level in all types of commercial refrigeration compressors. The compact design make it perfect for use with all reciprocating and scroll refrigeration compressors, but thanks to the **microprocessor-based electronics** can be setted-up to be used with all the type of compressors.

It can be **programmed** to optimize oil feeding cycles, alarm delay, temperature and voltage limits and it records in an **internal memory** useful information about running time, solenoid operations, filling cycles, alarms, working temperature and supply voltage.

It is characterized by a reliable level regulation thanks to a **Hall-sensor** that avoids all the problems typical of optical sensors - such as foam reading, external light or oil impurity interference. The **integrated solenoid** valve feeds missing oil directly into the compressor sump.

The IGLOO NOVO unit has been designed to allow **easily remove** and replace of the **electronic block** without need to depressurize or remove the oil from the compressor. The sight glass function remains fully available, while level information is indicated by mean of 3 LEDs. The integrated alarm function with compressor shut down guarantees a reliable **protection** of the system.

### Features

- The patented **magneto-electronic** innovative design is used for oil level regulators and for refrigerant level sensors
  - **Replaceable electronics** without need to depressurize or remove the oil from the compressor
  - Oil level magnetic sensor and solenoid valve are **protected by 3 filter strainers**
  - **Programmable** oil feeding cycles, sensitivity, alarm delays, (eventual) limit temperature and voltage alarms
  - **Live data recording** of running time, solenoid operations, filling cycles, alarms, working temperature, supply voltage
- 
- **Easy installation** by sight-glass replacement: direct mounting onto 3/4 bolts compressors and adapter kits available for various type of compressors
  - A **tilt sensor** integrated into the electronic block allows **left/right installation** of the regulator with automatic recognition of orientation, in order to orientate the LEDs and the sight glass to the preferred direction without need to disassembly the regulator
  - Broad range of **temperature**
    - Environment temperature from -40°C to +60°C
    - Fluid temperature from -30°C to +90°C
  - SPDT **relay output** contact for compressor shut down or alarming
    - Rating 230VAC / 5A
    - 1NO + 1NC output
  - **IP65**: protection rated 6 to dust and 5 to water
  - **CE** marking under Low Voltage and Electromagnetic Compatibility Directives

## Oil level regulator

### Operating logic

The **IGLOO NOVO** regulator controls the oil level between 45% and 55% of the sight glass by using 2 elements: a Hall-sensor and a patented permanent magnet designed to float onto the oil surface.






The magnetic field measured by the hall-sensor depends on the distance of the 2 elements and the magnetic signal is elaborated in real-time by a microprocessor to derive the exact oil level, with no possibility of errors due to foaming, external light interference or impurities into the oil.

Depending on the oil level, the microprocessor opens or closes an integrated solenoid valve which feeds missing oil directly into the compressor crankcase.



If the single oil feeding cycle exceeds the duration limit set to 90 seconds, the IGLOO NOVO generates an alarm signal and the alarm contacts (SPDT) change into alarm status. During the alarm status the oil continues to be filled into the compressor, and once the optimal oil level is restored the Alarm is immediately resetted.

Eventually the **IGLOO NOVO** can be programmed to set different oil feeding cycles, change the alarm delay, the temperature and the voltage alarms. During operation the live data recording is always active and it stores useful information about running time, solenoid operations, filling cycles, alarms, working temperature and supply voltage that can be used for troubleshooting or for optimization of the oil feeding cycles.

#### *Controller operation with standard settings: (delays are customizable)*

Oil level	Sight glass	LEDs Status	Delay (standard settings)	Solenoid function	Alarm relay (SPDT: 1 NC + 1 NO)
OK	45% ÷ 55%	 Green	-	-	-
LOW	< 45%	  Green - Orange	10 sec	Oil feed	-
EMPTY	<< 45%	  Red - Orange	Alarm: 90 sec Oil feed: 0 sec	Oil feed	Activated

#### **Oil level restore after filling cycle:**

LOW → OK	> 55%	 Green	0 sec	-	-
EMPTY → OK	> 55%	 Green	0 sec	-	Deactivated

## Oil and Refrigerant level management devices

### Supply

IGLOO NOVO units are complete of all the necessary cable connectors, o-rings and mounting bolts and are singly packed into carton boxes, with annex fitting instructions.

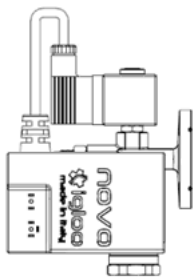
IGLOO NOVO-TR1/-TR3 are needed to supply 24V units with 230V AC 50Hz voltage and are singly packed into carton boxes, with annex fitting instructions and CE certificate of conformity.

IGLOO NOVO-RV35 differential oil check valves are useful to guarantee the necessary oil flow rate from the oil reservoir/receiver back to the compressor sump and are singly packed into carton boxes, with annex fitting instructions.

IGLOO ADP- series of adapter kits are available for various type of compressors and are supplied singly packed into carton boxes, with annex fitting instructions and CE certificate of conformity. Other adapter kits are available upon request.

### Ordering

*NOVO-OR Oil level regulators, with solenoid valve:*

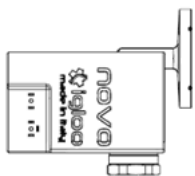


<b>NOVO-OR1A</b>	HFC, HCFC	Medium Temp. -30 ÷ +90 °C	PS 46 bar PT 51 bar MOPD 30 bar	230V AC, 50 Hz 6VA
<b>NOVO-OR1B</b>				24V AC, 50 Hz 6VA
<b>NOVO-OR2A</b>	CO <sub>2</sub> , HFC	Ambient Temp. -40 ÷ +60 °C	PS 60 bar PT 66 bar MOPD 34 bar	230V AC, 50 Hz 6VA
<b>NOVO-OR2B</b>				24V AC, 50 Hz 6VA

PS = Max. working pressure PT = Max. test pressure

MOPD = Solenoid valve max. operating pressure differential

*NOVO-OS Oil level detector, without solenoid valve:*



<b>NOVO-OS1A</b>	HFC, HCFC, CO <sub>2</sub>	Medium Temp. -30 ÷ +90 °C	PS 60 bar PT 85 bar	230V AC, 50 Hz 1VA
<b>NOVO-OS1B</b>				24V AC, 50 Hz 1VA

PS = Max. working pressure PT = Max. test pressure

*NOVO-RS Refrigerant level sensors, with integrated relay and sight glass:*



<b>NOVO-RS1A</b>	HFC, HCFC, CO <sub>2</sub>	Medium Temp. -30 ÷ +90 °C	PS 60 bar PT 85 bar	230V AC, 50 Hz 1VA
<b>NOVO-RS1B</b>				24V AC, 50 Hz 1VA

PS = Max. working pressure PT = Max. test pressure

## Accessories

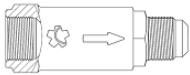
### NOVO-TR Voltage transformers:



<b>NOVO-TR1</b>	for 1 unit regulator or up to 7 units detector	Input (1): 230V AC, 50 Hz	Output (2): 24V AC, 50 Hz	Max. power rating: 8VA
<b>NOVO-TR3</b>	for 3 units regulator or up to 18 units detector			Max. power rating: 20VA

Higher power ratings are available upon request.

### NOVO-RV35 differential oil check valve:



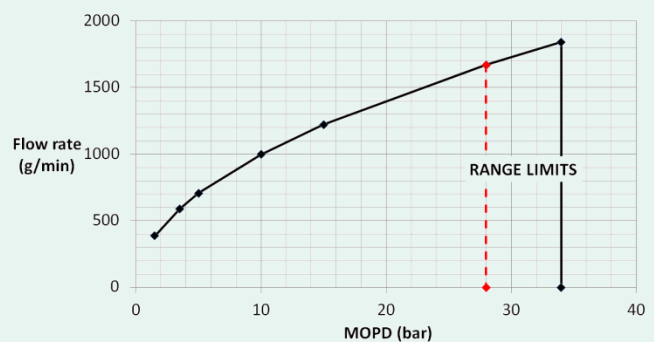
<b>NOVO-RV35</b>	HFC, HCFC, CO <sub>2</sub>	-40 ÷ +105 °C PS 60 bar PT 85 bar	Diff. pressure: 3,5 bar	Inlet: SAE f-3/8" Outlet: SAE m-3/8"
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PS = Max. working pressure PT = Max. test pressure

## Effect of voltage supply on maximum operating pressure differential (MOPD)

**To avoid MOPD reduction** it is recommended to stabilize the voltage supply. For example, generally is recommendable to use IGLOO NOVO oil level regulator 24 V AC supplied by a 230-to-24 V AC transformer instead of IGLOO NOVO oil level regulator 230 V AC. This solution beside being stronger may be also cheaper, because in rack systems 1 transformer can supply up to 3 IGLOO NOVO regulators.

**Supply Voltage -10%**  
Supply Voltage -0%






Flow rate with differential pressure 3,5 bar: 590 g/min.  
Oil: Reniso SP46 at +20 °C

## Oil level regulator

### Approvals

CE (PED, RoHS, REACH, LV, EMC), EAC. Patented design.

### Technical data



	NOVO-OR1A (46 bar - 230V)	NOVO-OR1B (46 bar - 24V)	NOVO-OR2A (60 bar - 230V)*	NOVO-OR2B (60 bar - 24V)*
	<b>Oil level regulator with integrated solenoid valve</b>			
<b>Supply power and voltage</b>	230 V AC 50 Hz $\pm 10\%$ VA	24 V AC 50 Hz $\pm 10\%$ 6VA	230 V AC 50 Hz $\pm 10\%$ VA	24 V AC 50 Hz $\pm 10\%$ 6VA
<b>Ambient temperature</b>	-40 $\div$ +60 °C			
<b>Medium temperature</b>	-30 $\div$ +90 °C			
<b>Max. working pressure, PS</b>	46 bar		60 bar	
<b>Max. test pressure, PT</b>	51 bar		66 bar	
<b>Max. differential pressure, MOPD</b>	30 bar		34 bar	
<b>Relay output type</b>	SPDT dry contacts: 1 contact NO + 1 contact NC			
<b>Relay Max. switching voltage</b>	AC load: 250V 50Hz / DC load: 30V			
<b>Relay Max. switching current</b>	AC load: 8A / DC load: 5A			
<b>Relay Max. power rating</b>	AC load: 2.000 VA / DC load: 150 W			
<b>Solenoid valve service life</b>	1 Million of oil feeding cycles			
<b>Cable type</b>	Cable ext. diameter range: 5 $\div$ 7mm, Conductors recommended diameter 0,75mm <sup>2</sup> Relay connector: 3 conductors, Voltage supply connector: 2 conductors			
<b>Protection class (with connectors)</b>	IP 65 according to IEC 529, EN 60529			
<b>Materials</b>	Body, inlet fitting and Adapters: Brass EN12164, EN12165 Screws and sight glass: Nickel plated steel EN 10027			
<b>Refrigerant compatibility</b>	HFC, HCFC, CO <sub>2</sub>			
<b>Lubricant compatibility</b>	All: mineral, synthetic and ester lubricants			
<b>Orientation of body unit</b>	Horizontal $\pm 1^\circ$ with automatic position identification Right mount: natural position, Left mount: 180° tilted position (upside down)			
<b>Level control</b>	50% $\pm 5\%$ of the sight glass			
<b>Oil inlet connection</b>	7/16"-20 UNF male, with strainer and o-ring (replaceable)			
<b>Led indication</b>	Green  Level OK	Green - Orange  Oil feeding cycle	Red - Orange  Alarm (and oil feeding)	
<b>Time dealy</b>	Oil feeding: 10 sec, customizable Alarm: 90 sec, customizable			

\* NOVO-OR2A and NOVO-OR2B can be incorporated also in compressors designed for CO<sub>2</sub> transcritical, but in conjunction with oil receivers / reservoirs up to maximum 60 bar.



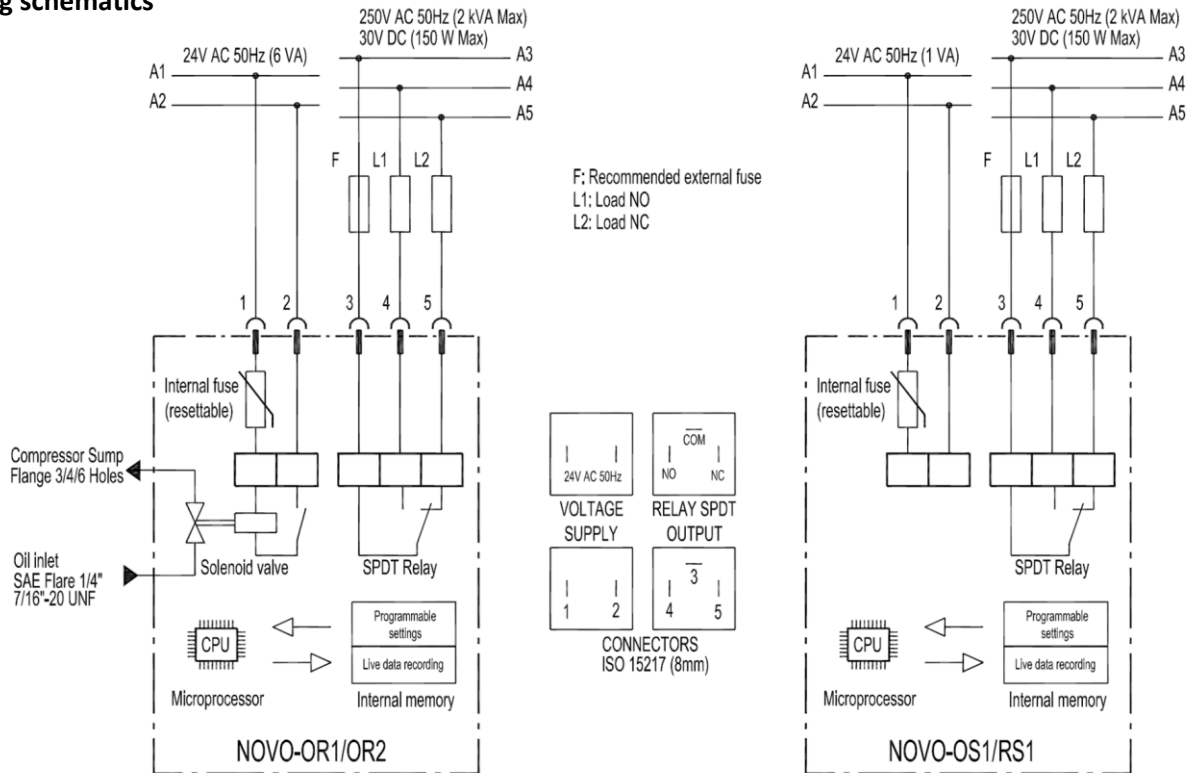
## Oil level detector and Refrigerant level sensor

### Technical data

	NOVO-OS1A (230V)	NOVO-OS1B (24V)	NOVO-RS1A (230V)	NOVO-RS1B (24V)
	Oil level detector without solenoid valve		Refrigerant level sensor with integrated relay output and sight glass	
Supply power and voltage	230 V AC 50 Hz ±10% 6VA	24 V AC 50 Hz ±10% 6VA	230 V AC 50 Hz ±10% 1VA	24 V AC 50 Hz ±10% 1VA
Ambient temperature	-40 ÷ +60 °C			
Medium temperature	-30 ÷ +90 °C			
Max. working pressure, PS	60 bar			
Max. test pressure, PT	85 bar			
Relay output type	SPDT dry contacts: 1 contact NO + 1 contact NC			
Relay Max. switching voltage	AC load: 250V 50Hz / DC load: 30V			
Relay Max. switching current	AC load: 8A / DC load: 5A			
Relay Max. power rating	AC load: 2.000 VA / DC load: 150 W			
Cable type	Cable ext. diameter range: 5 ÷ 7mm, Conductors recommended diameter 0,75mm <sup>2</sup> Relay connector: 3 conductors, Voltage supply connector: 2 conductors			
Protection class <i>with connectors</i>	IP 65 according to IEC 529, EN 60529			
Materials	Body and Adapters: Brass EN12164, EN12165 Screws and sight glass: Nickel plated steel EN 10027			
Refrigerant compatibility	HFC, HCFC, CO <sub>2</sub>			
Lubricant compatibility	All: mineral, synthetic and ester lubricants			
Orientation of body unit	Automatic identification of the orientation: - right sight glass (natural position) - left sight glass: (upside-down)		Frontal installation	
Level control	50% ±5% of the sight glass			
Led indication	Green  Level OK		Red  Level Low	
Time delay Alarm	90 sec, customizable		0 sec	

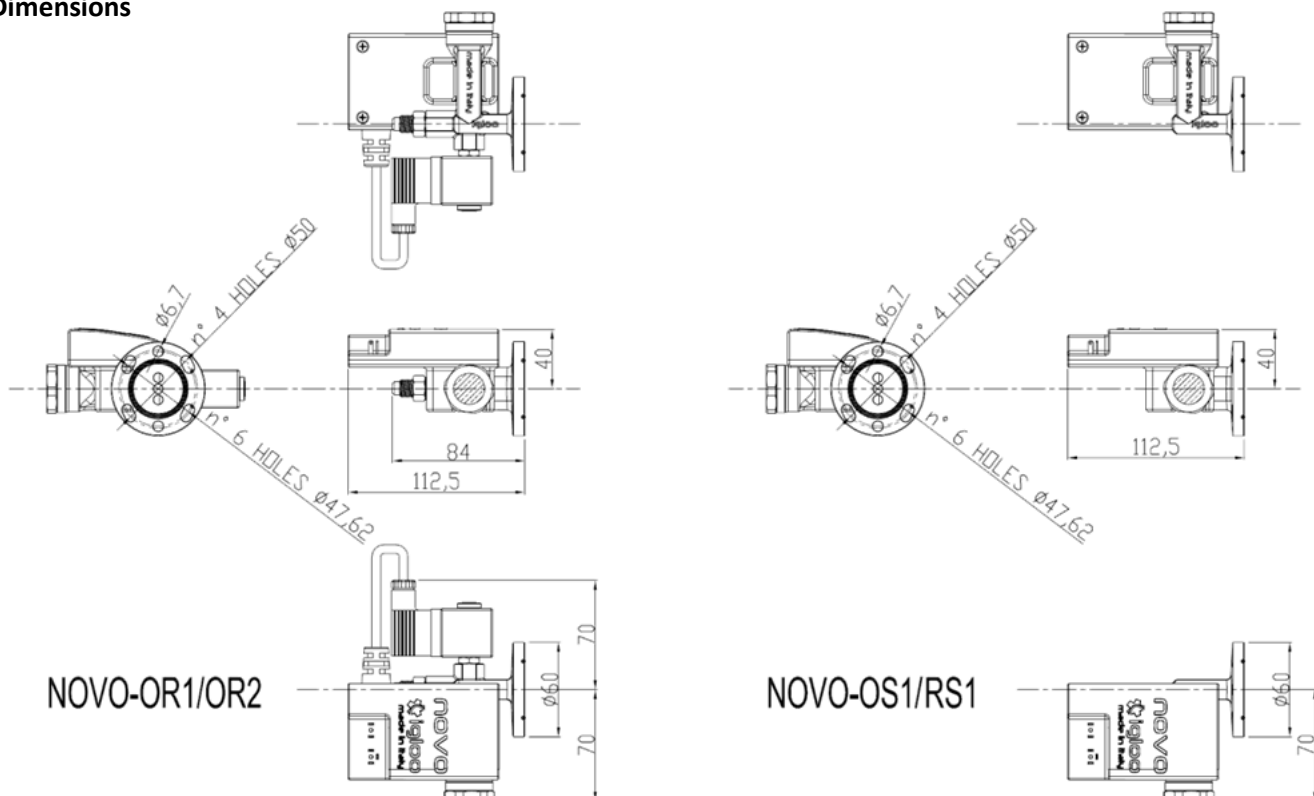
## Oil and refrigerant level management devices

### Wiring schematics



**Remark:** For simplicity the schematics refer to 24V AC devices. Same connection applies also to 230V AC devices.

### Dimensions



**Remark:** 3D models are available upon request.

## Adapters for oil level regulator

### Adapter selection guideline

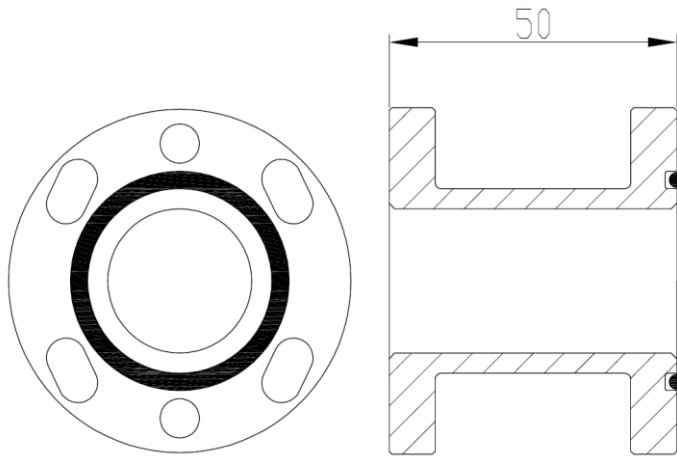
	Compressor series	Adapter selection
<b>Arctic Circle</b>	G2 G4 G6	ADP-A1 Direct connection without adapter is also possible.
<b>Bitzer</b>	4G 4H 4J 4NC 4NHC-20K 4PC 4PHC-15K 4TC 4THC-12K 4VC 4VHC-10K 4VNC 4Z 6F 6G 6H 6J 8FC 8GC S4 S6 4 - CTC, DTC, FTC, HTC, JTC, KTC, MTC, PTC	ADP-A1 Direct connection without adapter is also possible.
	2CHC-4K 2DC 2DHC-3K 2EC 2EHC-3K 2FC 2FHC-3K 2GC 2GHC-2K 2HC 2HHC-2K 2JC 2JHC-07K 2KC 2KHC-05K 4CC 4CHC-9K 4DC 4DHC-7K 4EC 4EHC-6K 4FC 4FHC-5K 4KTC-10K	ADP-A3
	ZL ZM	ADP-A4
<b>Bock</b>	HA 4 HA 5 HA6 HG 4 HG 5 HG 6 HG 7 HG 8 GX4/310-4 HGX4/385-4 HGX4/464-4 HGX4/555-4 HAX2...CO2 T HGX34 / 46...CO2 T	ADP-A1 Direct connection without adapter is also possible.
	HA12 HA22 HA34 HG12 HG22 HG34 HGX12P/40-4 HGX12P/50-4 HGX12P/60-4 HGX12P/75-4 HGX22P/110-4 HGX22P/125-4 HGX22P/160-4 HGX22P/190-4 HGX34P/215-4 HGX34P/555-4	ADP-A3
<b>Carrier</b>	EA ER	ADP-A1 Direct connection without adapter is also possible.
<b>Copeland</b>	4CC 6CC D2 D3 D4 D6.H D6.S D9 DM D8D D8S_ (except D8SJ and D8SK, installation only on one sight glass) 4MSL, 4MTL	ADP-A1 Direct connection without adapter is also possible.
	DK DL	ADP-A3
	ZB15 to ZB48 - until 06/2014 ZBD21 to ZBD45 - until 06/2014 ZB56, 75, 92, 11 - until 05/2012 ZF06 to ZF25 - until 06/2014 ZF24 to ZF48 - until 05/2012 ZS21 to ZS45 - until 06/2014 ZS56 to ZS11 - until 05/2012 ZO34 to ZO104 - until 06/2014 ZOD34 to ZOD104 - until 06/2014	ADP-A4
	ZB220 ZF24 to ZF48 ZH100/125/150 ZR90, 11, 12, 16, 19, 250 to ZR380 ZS56 to ZS11 ZP180 ZP235 to ZP485	ADP-A7
<b>Dorin</b>	ZB15 to ZB48 - after 06/2014 ZB50, 58, 66, 76, 95, 114 ZBD21 to ZBD45 - after 06/2014 ZF06 to ZF25 - after 06/2014 ZF(D)18 - after 06/2014 ZF48 ZH40/45/50/64/75 ZP90/103/104/120/122/137/154/182 ZR94/108/125/144/160/190 ZS21 to ZS45 - after 06/2014 ZO21, ZO34 to ZO104 - after 06/2014 ZOD34 to ZOD104 - after 06/2014	ADP-A6
	K Series (except for the models listed below) SCC500 B SCC750 B SCC1500 B SCC1900 B SCC2000 B SCC2500 B SCS340 D SCS351 D SCS362 D SCS373 D SCS385 D SCS3K8 D H Series(except H1) CDxx M H B CD2S-200, -400	ADP-A1 Direct connection without adapter is also possible.
	H1 K100CC K100CS K150CC K150CS K180CC K180CS K200CC K230CS K235CC K240SB K400CC K50CS K75CC K75CS SCC250 B SCC300 B SCC350 B SCC380 B	ADP-A3
<b>Frascold</b>	A A-SK B D D-SK F F-SK Q-SK S S-SK V W Z	ADP-A1 Direct connection without adapter is also possible.
<b>L'Unité Hermétique</b>	TAG TAH	ADP-A3
<b>Maneurop</b>	LT MT SM SZ	ADP-A3
<b>Prestcold</b>	P2 P3 P4 P6 P8 P9	ADP-A1 Direct connection without adapter is also possible.

Our applications engineering advice and the information contained in this guideline are based on experience and are made to the best of our knowledge and belief, they must be regarded however as non-binding advice without guarantee.

## Adapters for oil level regulator

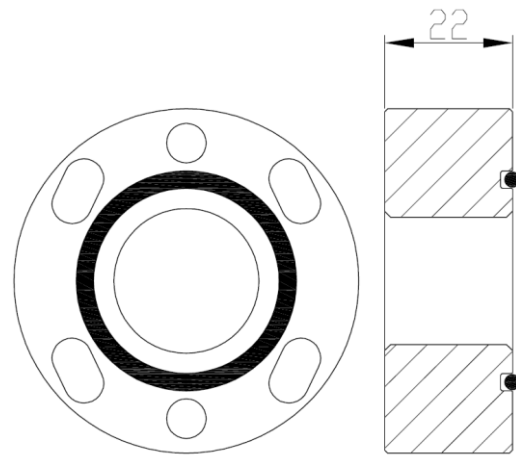
### ADP-A1

Flange 3/4/6 holes - Spacer 50mm



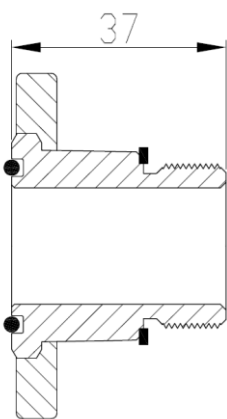
### ADP-A2

Flange 3/4/6 holes - Spacer 22mm



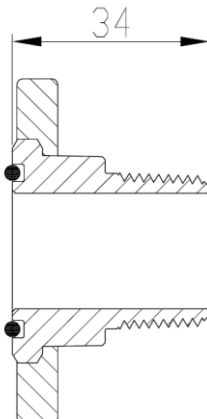
### ADP-A3

1.1/8"-18 UNEF



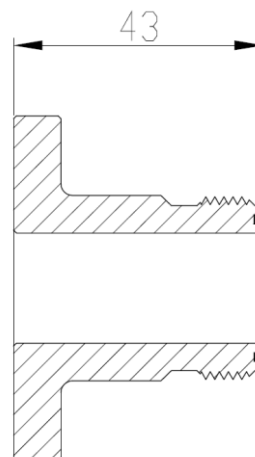
### ADP-A4

3/4"-14 NPT



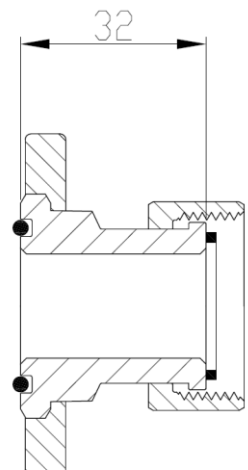
### ADP-A5

Rotalock 1.1/4"-12 UNF



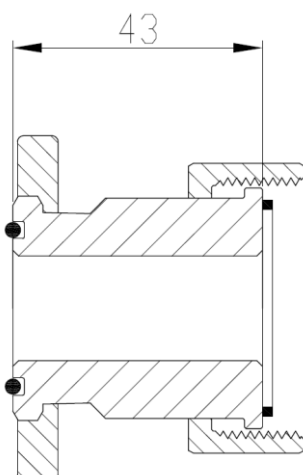
### ADP-A6

Rotalock 1.1/4"-12 UNF



### ADP-A7

Rotalock 1.3/4"-12 UNF

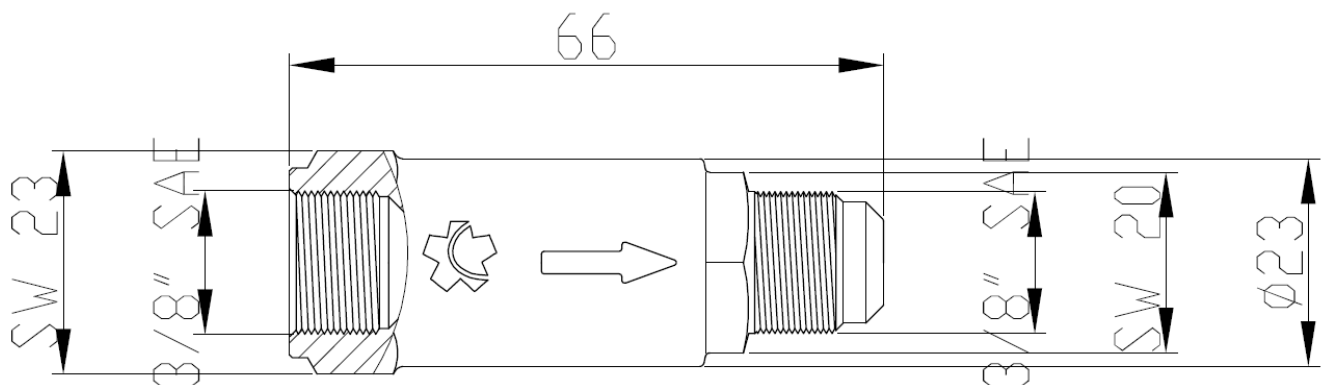


Adapter	Description	Cross reference	Material
ADP-A1	Flange 3/4/6 holes 50 mm spacer	Equivalent to Emerson Traxoil CUA, CCC, CUD	Brass EN 12164, EN 12165
ADP-A2	Flange 3/4/6 holes 22 mm spacer	-	
ADP-A3	1.1/8"-18 UNEF (male) with copper gasket	Equivalent to Emerson Traxoil CCB	
ADP-A4	3/4"-14 NPT (male)	Equivalent to Emerson Traxoil CCA	
ADP-A5	1.1/4"-12 UNF Rotalock Fitting (male) with PTFE Teflon® gasket	-	
ADP-A6	1.1/4"-12 UNF Rotalock Nut (female) with PTFE Teflon® gasket	Equivalent to Emerson Traxoil CCE	
ADP-A7	1.3/4"-12 UNF Rotalock Nut (female) with PTFE Teflon® gasket	Equivalent to Emerson Traxoil CCD	

# Differential oil check valve 3,5 bar

Optimized for NOVO magneto-electronic oil level regulator

The **NOVO-RV35** differential oil check valve is useful to vent pressure in the oil reservoir/separator while still maintaining a positive pressure differential of 3,5 bar between the reservoir and the compressor sump. This positive pressure ensures an adequate oil supply to the mechanical oil level regulator. The NOVO-RV35 oil reservoir pressure valve is directly mounted on the 3/8" SAE Flare connection of the reservoir and is piped to the suction line.



## Approvals

CE (PED, RoHS, REACH), EAC

## Supply

IGLOO NOVO differential oil check valves are singly packed into carton boxes, with annex fitting instructions and CE certificate of conformity.

## Technical data

*NOVO differential oil check valve:*

<b>NOVO-RV35</b>	HFC, HCFC, CO <sub>2</sub>	-40 ÷ +105 °C PS 60 bar PT 85 bar	Diff. pressure: 3,5 bar	Inlet: SAE f-3/8" Outlet: SAE m-3/8"
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PS = Max. working pressure PT = Max. test pressure

## Materials

Body: Forged brass EN12165  
Internal parts: Turned brass EN12164  
Spring: Austenitic stainless steel AISI 302  
External sealing: CR Chloroprene rubber  
Internal sealing: Special PTFE





## Ball valves for refrigerants

**IGLOO** ball valves are bi-directional shut-off valves for refrigerants, manually operated, suitable for liquid, suction and hot-gas line in refrigeration and air-conditioning systems.

All the valves are equipped with one-piece wire seal cap and a rear mounting bracket.

Optionally for all the models is available an external access port.

Direct flow gives maximum through-flow with minimum pressure drop across the valve.

The combination of welded valve body, ball seat/seal made of Teflon®, double spindle o-ring seal and cap seal gives absolute tightness against leakage.

### Features

- Broad range of temperature: from -40°C (-40°F) to +150°C (+300°F)
- 1/4 turn from fully open to fully closed position
  - Mechanical stop to rotation
  - Open/close status indication on the valve body
- All sizes are full port
  - Higher flow rate, lower pressure drop
- Bi-directional flow
  - Can be mounted in any position
- Available external access port for service to the system
- One-piece wire seal cap as required by European Safety and Environmental Directive EN 378
- Hermetic welded design
- All the valves manufactured are singly leak tested and pressure tested
  - Pressure test at 70bar
  - Leak test with helium in a high vacuum chamber according to EN 1779.B6
- Balls have a pressure equalization hole
  - Prevents trapped pressure in valve body cavity
- Burst-proof spindle mounted from the inside
- Supplied with mounting brackets for panel fixing as standard
- Selected technical rubbers and Teflon® compounds for internal sealing elements



## Ball valves for refrigerants

### Approvals

CE (PED, RoHS, REACH), EAC

### Technical data

Suitable for HCFC, HFC and R744 (CO<sub>2</sub>) refrigerants. Not suitable for ammonia.

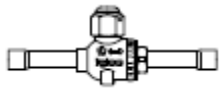
<b>BSS series</b>	without access port	-40 ÷ +150 °C	45bar
<b>BSA series</b>	with access port	-40 ÷ +300 °F	650psig

### Supply

IGLOO ball valves have holes for panel mounting and mounting brackets into each box. The valves are singly packaged into carton boxes, with annex fitting instructions and CE certificate of conformity.

### Ordering

*BSS series, standard*



Part number	ODF Connections (aka ODS)		Orifice	Kv (m3/h)	PED 97/23/EC
	mm	inch	Ø S (mm)	UNI 9182:2010	Risk Category
<b>BSS-M6</b>	O.D. 6mm	-	10	1,2	Art.3 Par.3
<b>BSS-4</b>	-	O.D. 1/4"	10	1,2	
<b>BSS-5</b>	O.D. 8mm	O.D. 5/16"	10	1,2	
<b>BSS-6</b>	-	O.D. 3/8"	10	3,5	
<b>BSS-M10</b>	O.D. 10mm	-	10	3,5	
<b>BSS-M12</b>	O.D. 12mm	-	10	6,6	
<b>BSS-8</b>	-	O.D. 1/2"	10	6,6	
<b>BSS-M15</b>	O.D. 15mm	-	13	15	
<b>BSS-10</b>	O.D. 16mm	O.D. 5/8"	13	15	
<b>BSS-M18</b>	O.D. 18mm	-	16	20	
<b>BSS-12</b>	O.D. 19mm	O.D. 3/4"	16	20	
<b>BSS-14</b>	O.D. 22mm	O.D. 7/8"	19	24	
<b>BSS-M28</b>	O.D. 28mm	-	25	42	
<b>BSS-18</b>	-	O.D. 1.1/8"	25	42	
<b>BSS-22</b>	O.D. 35mm	O.D. 1.3/8"	32	65	I
<b>BSS-26</b>	-	O.D. 1.5/8"	40	110	
<b>BSS-M42</b>	O.D. 42mm	-	40	110	
<b>BSS-34</b>	O.D. 54mm	O.D. 2.1/8"	50	190	
<b>BSS-M64</b>	O.D. 64mm	-	65	300	
<b>BSS-42</b>	-	O.D. 2.5/8"	65	300	
<b>BSS-48</b>	O.D. 76mm	O.D. 3"	65	300	
<b>BSS-50</b>	O.D. 80mm	O.D. 3.1/8"	65	300	

## Ball valves with access port

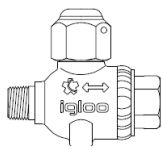
### Ordering (continued)

*BSA series, with access port*



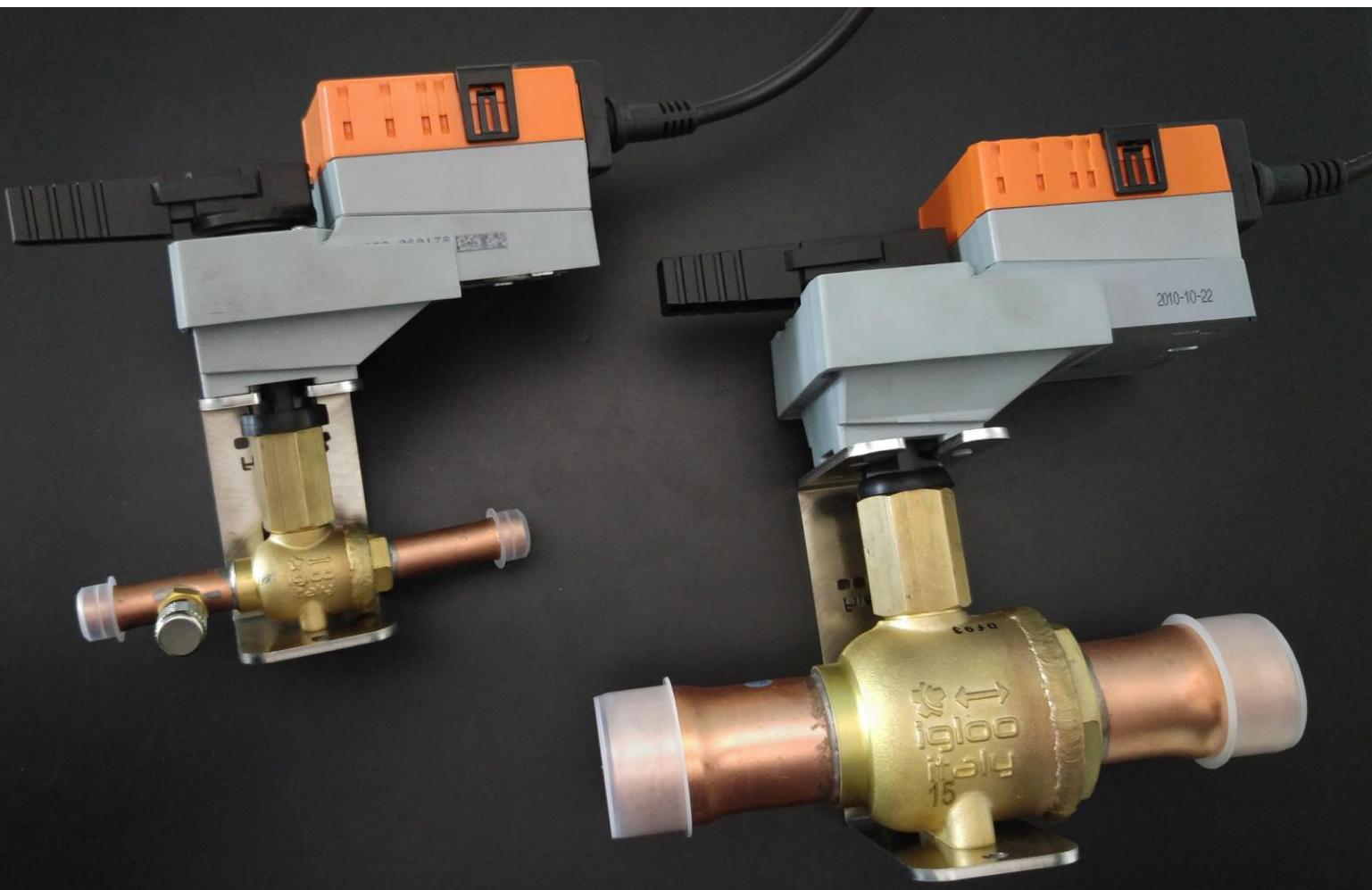
Part number	ODF Connections (aka ODS)		Orifice	Kv (m3/h)	PED 97/23/EC
	mm	inch	Ø S (mm)	UNI 9182:2010	Risk Category
<b>BSA-M6</b>	O.D. 6mm	-	10	1,2	<b>Art.3 Par.3</b>
<b>BSA-4</b>	-	O.D. 1/4"	10	1,2	
<b>BSA-5</b>	O.D. 8mm	O.D. 5/16"	10	1,2	
<b>BSA-6</b>	-	O.D. 3/8"	10	3,5	
<b>BSA-M10</b>	O.D. 10mm	-	10	3,5	
<b>BSA-M12</b>	O.D. 12mm	-	10	6,6	
<b>BSA-8</b>	-	O.D. 1/2"	10	6,6	
<b>BSA-M15</b>	O.D. 15mm	-	13	15	
<b>BSA-10</b>	O.D. 16mm	O.D. 5/8"	13	15	
<b>BSA-M18</b>	O.D. 18mm	-	16	20	
<b>BSA-12</b>	O.D. 19mm	O.D. 3/4"	16	20	
<b>BSA-14</b>	O.D. 22mm	O.D. 7/8"	19	24	
<b>BSA-M28</b>	O.D. 28mm	-	25	42	
<b>BSA-18</b>	-	O.D. 1.1/8"	25	42	
<b>BSA-22</b>	O.D. 35mm	O.D. 1.3/8"	32	65	
<b>BSA-26</b>	-	O.D. 1.5/8"	40	110	<b>I</b>
<b>BSA-M42</b>	O.D. 42mm	-	40	110	
<b>BSA-34</b>	O.D. 54mm	O.D. 2.1/8"	50	190	
<b>BSA-M64</b>	O.D. 64mm	-	65	300	
<b>BSA-42</b>	-	O.D. 2.5/8"	65	300	
<b>BSA-48</b>	O.D. 76mm	O.D. 3"	65	300	
<b>BSA-50</b>	O.D. 80mm	O.D. 3.1/8"	65	300	

*BSN series. Lead-sealed with NPT male-to-female threads for safety valves.*



Part number	NPT Connection Thread ANSI B1.20.1		Orifice	Kv (m3/h)	PED 97/23/EC
	ext thread (male)	int thread (female)	Ø S (mm)	UNI 9182:2010	Risk Category
<b>BSN-8</b>	NPT 1/2"	NPT 1/2"	16	20	<b>Art.3 Par.3</b>
<b>BSN-12</b>	NPT 1/2"	NPT 1/2"	19	24	
<b>BSN-16</b>	NPT 1"	NPT 1"	25	42	

## Full flow electronic valves



## Full flow electronic valves

The **IGLOO MOTO** full flow electronic valves are bi-directional ball valves for refrigerants actuated by means of brushless servo-operators and are suitable for oil, liquid, suction and hot-gas line in refrigeration and air-conditioning systems: on-off type can be used to shut-off the flow and modulating type can be used to regulate the flow.

Optionally for all the models is available an external access port.

Despite other electronic valves such as solenoid valves, the flow gives maximum through-flow with minimum pressure drop across valve in both directions and internal leaks are not dependent from the differential pressure across the valve.

The combination of welded valve body, ball seat with seal made of PTFE Teflon®, double spindle o-ring seal and cap seal gives absolutely minimum leakage: final tests done on all the pieces produced guarantee leakrate sensibly lower than 1 gram/year of refrigerant.

### Features

- Broad range of temperature:
  - Fluid from -40°C (-40°F) to +150°C (+300°F)
  - Ambient from -30°C (-22°F) to +55°C (+130°F)
- All sizes are full port
  - Higher flow rate, lower pressure drop
- Internal tightness not dependent from the back-pressure across the valve
  - No need of check valves to guarantee the tightness
- Bi-directional flow
  - Can be mounted in any position
- Available external access port for service to the system
- Hermetic welded design
- All the valves manufactured are singly leak tested and pressure tested
  - Pressure test at 70bar
  - Leak test with helium in a high vacuum chamber according to EN 1779.B6
- Balls have a pressure equalization hole
  - Open/Close torque independent from the operating pressure
  - Prevents trapped pressure in valve body cavity, with consequent potential failure due to burst in case of overheating
- Burst-proof spindle mounted from the inside
- Can be panel fixed
- Selected technical rubbers and Teflon® compounds for internal sealing elements

## Full flow electronic valves

### Approvals

CE (PED, RoHS, REACH, LV, ECM), EAC

### Technical data

Suitable for HCFC, HFC and R744 (CO<sub>2</sub>) refrigerants. Not suitable for ammonia.

Standard valves:

<b>BKS series</b>	without access port	-40 ÷ +150 °C	45bar
<b>BKA series</b>	with access port	-40 ÷ +300 °F	650psig

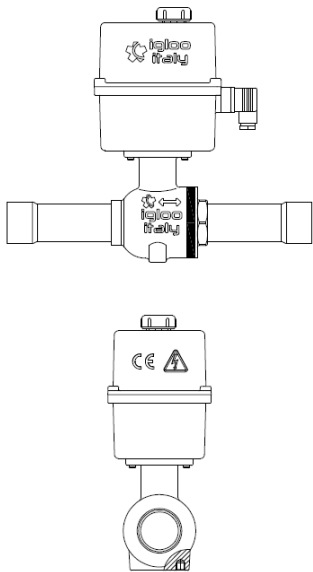
### Supply

IGLOO ball valves are supplied with mounting brackets for the actuator already assembled from the factory. The actuator brackets have holes to allow easy fixing of the valve to the wall. The valves are singly packaged into carton boxes with annex fitting instructions. The actuators are supplied into its own box, and we recommend to connect it to the valve just after the brazing in order to prevent demaging it due to overheating.

### Ordering

*BKS series without access port*

Part number	ODF Connections (aka ODS)		Orifice	Kv (m <sup>3</sup> /h)	PED 97/23/EC
	mm	inch	Ø S (mm)	UNI 9182:2010	Risk Category
<b>BKS-M6</b>	O.D. 6mm	-	10	1,2	Art.3 Par.3
<b>BKS-4</b>	-	O.D. 1/4"	10	1,2	
<b>BKS-5</b>	O.D. 8mm	O.D. 5/16"	10	1,2	
<b>BKS-6</b>	-	O.D. 3/8"	10	3,5	
<b>BKS-M10</b>	O.D. 10mm	-	10	3,5	
<b>BKS-M12</b>	O.D. 12mm	-	10	6,6	
<b>BKS-8</b>	-	O.D. 1/2"	10	6,6	
<b>BKS-M15</b>	O.D. 15mm	-	13	15	
<b>BKS-10</b>	O.D. 16mm	O.D. 5/8"	13	15	
<b>BKS-M18</b>	O.D. 18mm	-	16	20	
<b>BKS-12</b>	O.D. 19mm	O.D. 3/4"	16	20	
<b>BKS-14</b>	O.D. 22mm	O.D. 7/8"	19	24	
<b>BKS-M28</b>	O.D. 28mm	-	25	42	
<b>BKS-18</b>	-	O.D. 1.1/8"	25	42	
<b>BKS-22</b>	O.D. 35mm	O.D. 1.3/8"	32	65	I
<b>BKS-26</b>	-	O.D. 1.5/8"	40	110	
<b>BKS-M42</b>	O.D. 42mm	-	40	110	
<b>BKS-34</b>	O.D. 54mm	O.D. 2.1/8"	50	190	
<b>BKS-M64</b>	O.D. 64mm	-	65	300	
<b>BKS-42</b>	-	O.D. 2.5/8"	65	300	
<b>BKS-48</b>	O.D. 76mm	O.D. 3"	65	300	
<b>BKS-50</b>	O.D. 80mm	O.D. 3.1/8"	65	300	

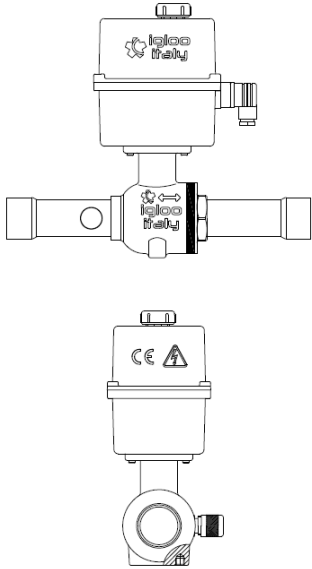


Full flow electronic valves

Ordering

BSS series with access port

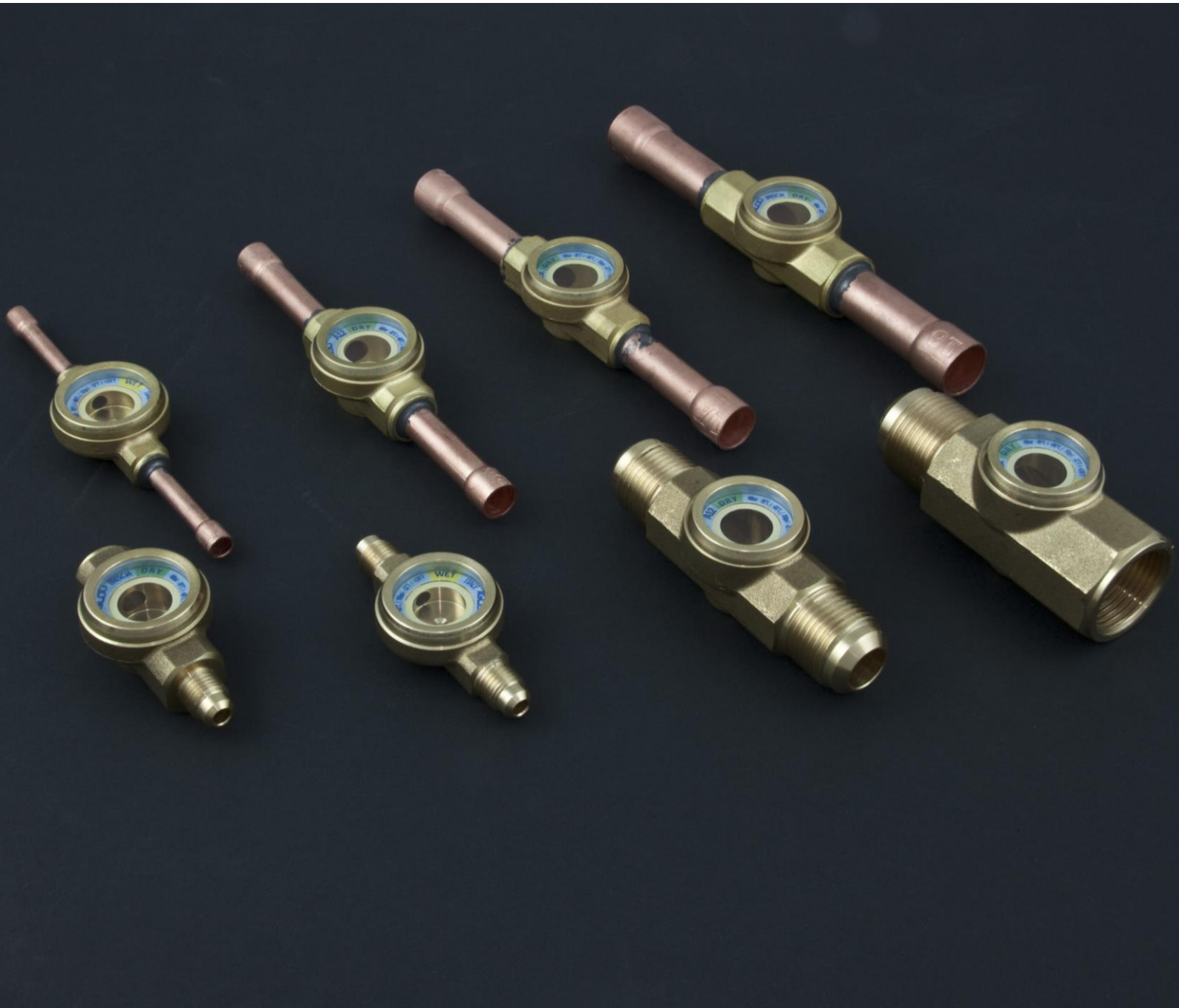
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Part number	ODF Connections (aka ODS)		Orifice	Kv (m3/h)	PED 97/23/EC
	mm	inch	Ø S (mm)	UNI 9182:2010	Risk Category
BKA-M6	O.D. 6mm	-	10	1,2	Art.3 Par.3
BKA-4	-	O.D. 1/4"	10	1,2	
BKA-5	O.D. 8mm	O.D. 5/16"	10	1,2	
BKA-6	-	O.D. 3/8"	10	3,5	
BKA-M10	O.D. 10mm	-	10	3,5	
BKA-M12	O.D. 12mm	-	10	6,6	
BKA-8	-	O.D. 1/2"	10	6,6	
BKA-M15	O.D. 15mm	-	13	15	
BKA-10	O.D. 16mm	O.D. 5/8"	13	15	
BKA-M18	O.D. 18mm	-	16	20	
BKA-12	O.D. 19mm	O.D. 3/4"	16	20	
BKA-14	O.D. 22mm	O.D. 7/8"	19	24	
BKA-M28	O.D. 28mm	-	25	42	
BKA-18	-	O.D. 1.1/8"	25	42	
BKA-22	O.D. 35mm	O.D. 1.3/8"	32	65	
BKA-26	-	O.D. 1.5/8"	40	110	
BKA-M42	O.D. 42mm	-	40	110	
BKA-34	O.D. 54mm	O.D. 2.1/8"	50	190	
BKA-M64	O.D. 64mm	-	65	300	
BKA-42	-	O.D. 2.5/8"	65	300	
BKA-48	O.D. 76mm	O.D. 3"	65	300	
BKA-50	O.D. 80mm	O.D. 3.1/8"	65	300	



## Sight glasses with moisture indicators



## Sight glasses with moisture indicators

IGLOO sight glasses helps to formulate a proper diagnosis of the refrigerant system.

IGLOO sight glasses are equipped with a sensitive indicator that reflects a colour, depending on the moisture content of the refrigerant, changing from green (dry) to yellow (wet) and can be mounted inline to indicate:

- The moisture content in refrigerant
- Lack of sub-cooling
- Refrigerant deficiency
- In liquid line, the condition of refrigerant
- In return line from the oil separator, the flow of oil

### Features

- Broad range of temperature: from -30°C (-22°F) to +80 °C (176°F)
- Provides fast and easy indication of:
  - System high moisture content
  - Lack of subcooling or low system charge
- High purity tempered crystal
  - Easy viewing
  - Eliminates risk of explosion
- The same indicator can be used for all refrigerants
  - Suitable for HCFC, HFC and R744 (CO<sub>2</sub>) refrigerants
  - Big size, annular indicator ring
  - Proven dirt resistance
- Hermetic sealed design
  - Not dismountable
  - Explosion proof
- All the sight glasses are singly leak tested and pressure tested
  - Pressure test at 70bar
  - Leak test with helium in a high vacuum chamber according to EN 1779.B6
- Available in threaded (SAE flare 45°), solder and saddle versions



## Sight glasses and moisture indicators

### Approvals

CE (PED, RoHS, REACH), EAC

### Moisture levels

The moisture indicator of IGLOO sight glasses has been developed to operate with all the refrigerants.

Be aware that hermetic compressors only tolerate very low moisture content, while semi-hermetic and other compressors normally tolerate higher moisture contents in the refrigerant. Also, polyester oil for HFC refrigerants (R134a, R404A, R407C) reacts with water in a hydrolysis generating acid and alcohol. For this reason normally acceptable moisture concentration with HFC refrigerants is sensibly lower than with HCFC refrigerants (R22).

The colour on the indicator reflects the moisture content of the refrigerant: values under “green/dry” are to be considered as perfect condition meaning full protection against harmful effects from moisture or, in other words, the filter drier is working properly.

When the green colour starts to fade, the colour change has begun and the indicator should therefore be watched more carefully because when the colour changes to yellow it is a clear signal that the capacity of the filter drier is exceeded and should be replaced as soon as possible.

After about 24 hours from the replacing of the filter drier the sight glass should be controlled again to verify that green colour has been resetted, meaning that the replacing of the filter drier has been properly done.

		Moisture content into refrigerant (ppm)					
		R22	R134a	R404A	R407C	R410A	R507
<b>Safe</b>	Green / Dry	<60	<75	<30	<30	<30	<30
<b>Attention</b>	Chartreuse	60	75	30	30	30	30
<b>Danger</b>	Yellow / Wet	>60	>75	>30	>30	>30	>30

*Moisture values of other refrigerants are available upon request.*

### Technical data

Suitable for HCFC, HFC and R744 (CO<sub>2</sub>) refrigerants. Not suitable for ammonia.  
Guaranteed leakrate is less than 1 gram/year of refrigerant.

#### *Sight glasses, moisture and liquid indicators*

<b>MIF series</b>	external-internal threads (male-female threads) acc. to SAE J513 (Flare 45°)	-30 ÷ +80 °C -22 ÷ +176 °F	48bar 700psig
<b>MIM series</b>	external-external threads (male-male threads) acc. to SAE J513 (Flare 45°)		
<b>MIS series</b>	solder connections ODF/ODF mm and inch sizes		
<b>MIT series</b>	saddle type solder connection		

## Sight glasses and moisture indicators

### Standard supplies

Packaged into single carton boxes, with annex fitting instructions and CE certificate.

### Ordering

#### *MIF moisture indicators flare mount, male-female*



Part number	Threads ANSI/ASME B1.1		Flare Connections SAE J513	PED 97/23/EC
	ext thread (male)	int thread (female)		Risk Category
MIF-4	7/16" - 20 UNF	7/16" - 20 UNF	1/4"	Art.3 Par.3
MIF-6	5/8" - 18 UNF	5/8" - 18 UNF	3/8"	
MIF-8	3/4" - 16 UNF	3/4" - 16 UNF	1/2"	
MIF-10	7/8" - 14 UNF	7/8" - 14 UNF	5/8"	
MIF-12	1.1/16" - 14 UNS	1.1/16" - 14 UNS	3/4"	

#### *MIM moisture indicators flare mount, male-male*



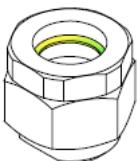
Part number	Threads ANSI/ASME B1.1		Flare Connections SAE J513	PED 97/23/EC
	ext thread (male)	ext thread (male)		Risk Category
MIM-4	7/16" - 20 UNF	7/16" - 20 UNF	1/4"	Art.3 Par.3
MIM-6	5/8" - 18 UNF	5/8" - 18 UNF	3/8"	
MIM-8	3/4" - 16 UNF	3/4" - 16 UNF	1/2"	
MIM-10	7/8" - 14 UNF	7/8" - 14 UNF	5/8"	
MIM-12	1.1/16" - 14 UNS	1.1/16" - 14 UNS	3/4"	

#### *MIS moisture indicators solder mount, ODF/ODF*



Part number	ODF Connections (aka ODS)		PED 97/23/EC
	mm	inch	Risk Category
MIS-M6	O.D. 6mm	-	Art.3 Par.3
MIS-4	-	O.D. 1/4"	
MIS-6	-	O.D. 3/8"	
MIS-M10	O.D. 10mm	-	
MIS-M12	O.D. 12mm	-	
MIS-8	-	O.D. 1/2"	
MIS-10	O.D. 16mm	O.D. 5/8"	
MIS-M18	O.D. 18mm	-	
MIS-12	O.D. 19mm	O.D. 3/4"	
MIS-14	O.D. 22mm	O.D. 7/8"	

#### *MIT moisture indicators, saddle type*



Part number	Saddle connections		PED 97/23/EC
	mm	inch	Risk Category
MIT-10	16mm	5/8"	Art.3 Par.3
MIT-12	19mm	3/4"	
MIT-14	22mm	7/8"	
MIT-18	28mm	1.1/8"	
MIT-22	35mm	1.3/8"	
MIT-26	42mm	1.5/8"	
MIT-34	54mm	2.1/8"	

**Remark:** Sight glasses can be supplied also without moisture indicator.

## Brass fittings and access valves



IGLOO brass fittings for refrigeration and air-conditioning systems comply to DIN 8912 standard, SAE J513 standard, U.S. Military Standards MS-35867 through MS35873 inclusive, MS-35919, MS-24815 and MS-16993.

### Features

- Recommended maximum working pressure (PS): 45 bar (650 psig)
- Manufactured from brass forgings (compliant to standards EN 12420 and EN 12165) or drawn brass rod (compliant to standard EN 12164) eliminating the possibility of seepage by porosity
- Accurately machined and fully protected against damage during shipping, handling and storage to assure tight leakproof joints
- Smooth interior finish provides unrestricted flow and reduced pressure drop
- Smooth sealing surfaces finish and tight tolerances to eliminate the risk of leakage
- Risk category as per Art. 3 Par. 3 of Directive PED 97/23/EC

**Approvals**

CE (PED, RoHS, REACH), EAC

**Technical data**

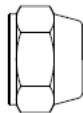
Suitable for HCFC, HFC and R744 (CO<sub>2</sub>) refrigerants. Not suitable for ammonia.  
 Guaranteed leakrate for IGLOO brass fittings is less than 0,1 gram/year of refrigerant.

**Standard supplies**

Standard packaging of fittings is plastic bags into carton boxes.  
 Each plastic bag and each carton box has a label showing a bilingual description (italian/english), barcode, part number and q.ty of pieces contained.

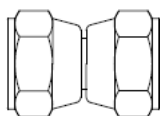
**Ordering**

*Forged nuts*



Part number	Thread ANSI/ASME B1.1	Flare connection SAE J513	Tube diameter		Tightening torque
	int thread (female)		mm	inch	Nm (lbf-ft)
NS4-4	7/16" - 20 UNF	1/4"	6	1/4"	11÷14 (8÷10)
NS4-5	1/2" - 20 UNF	5/16"	8	5/16"	11÷14 (8÷10)
NRS4-64	5/8" - 18 UNF	3/8"	6	1/4"	20÷25 (15÷18.5)
NRS4-65	5/8" - 18 UNF	3/8"	8	5/16"	20÷25 (15÷18.5)
NS4-6	5/8" - 18 UNF	3/8"	-	3/8"	20÷25 (15÷18.5)
NS4-6M10	5/8" - 18 UNF	3/8"	10	-	20÷25 (15÷18.5)
NRS4-86	3/4" - 16 UNF	1/2"	-	3/8"	34÷47 (25÷34.5)
NS4-8M10	3/4" - 16 UNF	1/2"	10	-	34÷47 (25÷34.5)
NS4-8M12	3/4" - 16 UNF	1/2"	12	-	34÷47 (25÷34.5)
NS4-8	3/4" - 16 UNF	1/2"	-	1/2"	34÷47 (25÷34.5)
NS4-10M12	7/8" - 14 UNF	5/8"	12	-	54÷75 (40÷55)
NRS4-108	7/8" - 14 UNF	5/8"	-	1/2"	54÷75 (40÷55)
NS4-10M14	7/8" - 14 UNF	5/8"	14	-	54÷75 (40÷55)
NS4-10	7/8" - 14 UNF	5/8"	16	5/8"	54÷75 (40÷55)
NS4-12M14	1.1/16" - 14 UNS	3/4"	14	-	68÷71 (50÷52)
NRS4-1210	1.1/16" - 14 UNS	3/4"	16	5/8"	68÷71 (50÷52)
NS4-12M18	1.1/16" - 14 UNS	3/4"	18	-	68÷71 (50÷52)
NS4-12	1.1/16" - 14 UNS	3/4"	19	3/4"	68÷71 (50÷52)
NS4-14	1.1/4" - 12 UNF	7/8"	22	7/8"	90÷120 (66÷98)
NRS4-1614	1.3/8" - 12 UNF	1"	22	7/8"	120÷150 (98÷110)
NS4-16	1.3/8" - 12 UNF	1"	-	1"	120÷150 (98÷110)

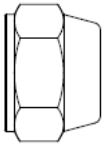
*Swivel nuts*



Part number	Thread ANSI/ASME B1.1	Flare Connection SAE J513	Tightening torque
	int thread (female)		Nm (lbf-ft)
US4-4	7/16" - 20 UNF	1/4"	11÷14 (8÷10)
US4-6	5/8" - 18 UNF	3/8"	20÷25 (15÷18.5)
US4-8	3/4" - 16 UNF	1/2"	34÷47 (25÷34.5)
US4-10	7/8" - 14 UNF	5/8"	54÷75 (40÷55)

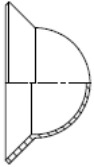
Ordering  
(continued)

*Forged cap nuts*



Part number	Thread ANSI/ASME B1.1	Flare Connection SAE J513	Tightening torque
	int thread (female)		Nm (lbf-ft)
N5-4	7/16" - 20 UNF	1/4"	11÷14 (8÷10)
N5-5	1/2" - 20 UNF	5/16"	8.5÷11.5 (6÷8.5)
N5-6	5/8" - 18 UNF	3/8"	20÷25 (15÷18.5)
N5-8	3/4" - 16 UNF	1/2"	34÷47 (25÷34.5)

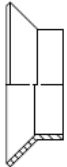
*Copper gaskets*



Part number	Flare Connection SAE J513	Maximum Working Pressure PS
		bar (psi)
B1-4	1/4"	30 (430)
B1-6	3/8"	30 (430)
B1-8	1/2"	30 (430)
B1-10	5/8"	30 (430)
B1-12	3/4"	30 (430)

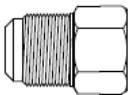


B2-4	1/4"	30 (430)
B2-6	3/8"	30 (430)
B2-8	1/2"	30 (430)
B2-10	5/8"	30 (430)
B2-12	3/4"	30 (430)



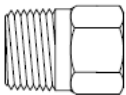
B3-4	1/4"	30 (430)
B3-6	3/8"	30 (430)
B3-8	1/2"	30 (430)
B3-10	5/8"	30 (430)
B3-12	3/4"	30 (430)

*Flared plugs*



Part number	Thread ANSI/ASME B1.1	Flare connection SAE J513
	ext thread (male)	
P2-4	7/16" - 20 UNF	1/4"
P2-6	5/8" - 18 UNF	3/8"
P2-8	3/4" - 16 UNF	1/2"

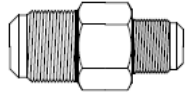
*NPT plugs*



Part number	NPT Connection Thread ANSI B1.20.1
	ext thread (male)
P1-A	NPT 1/8"
P1-B	NPT 1/4"
P1-C	NPT 3/8"
P1-D	NPT 1/2"

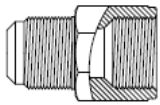
Ordering  
(continued)

*Straight unions, male-male Flare*



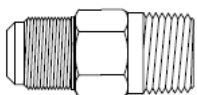
Part number	Thread ANSI/ASME B1.1		Flare Connection SAE J513	
	ext thread (male)	ext thread (male)	ext flare (male)	ext flare (male)
U2-4	7/16" - 20 UNF	7/16" - 20 UNF	1/4"	1/4"
UR2-64	5/8" - 18 UNF	7/16" - 20 UNF	3/8"	1/4"
U2-6	5/8" - 18 UNF	5/8" - 18 UNF	3/8"	3/8"
UR2-84	3/4" - 16 UNF	7/16" - 20 UNF	1/2"	1/4"
UR2-86	3/4" - 16 UNF	5/8" - 18 UNF	1/2"	3/8"
U2-8	3/4" - 16 UNF	3/4" - 16 UNF	1/2"	1/2"
UR2-104	7/8" - 14 UNF	7/16" - 20 UNF	5/8"	1/4"
UR2-106	7/8" - 14 UNF	5/8" - 18 UNF	5/8"	3/8"
UR2-108	7/8" - 14 UNF	3/4" - 16 UNF	5/8"	1/2"
U2-10	7/8" - 14 UNF	7/8" - 14 UNF	5/8"	5/8"
UR2-128	1.1/16" - 14 UNS	3/4" - 16 UNF	3/4"	1/2"
UR2-1210	1.1/16" - 14 UNS	7/8" - 14 UNF	3/4"	5/8"
U2-12	1.1/16" - 14 UNS	1.1/16" - 14 UNS	3/4"	3/4"

*Straight unions, male-female Flare*



Part number	Thread ANSI/ASME B1.1		Flare Connection SAE J513	
	int thread (female)	ext thread (male)	int flare (female)	ext flare (male)
UP3-4	7/16" - 20 UNF	7/16" - 20 UNF	1/4"	1/4"
UR3-46	7/16" - 20 UNF	5/8" - 18 UNF	1/4"	3/8"
UR3-64	5/8" - 18 UNF	7/16" - 20 UNF	3/8"	1/4"
UP3-6	5/8" - 18 UNF	5/8" - 18 UNF	3/8"	3/8"
UR3-68	5/8" - 18 UNF	3/4" - 16 UNF	3/8"	1/2"
UR3-84	3/4" - 16 UNF	7/16" - 20 UNF	1/2"	1/4"
UR3-86	3/4" - 16 UNF	5/8" - 18 UNF	1/2"	3/8"
UP3-8	3/4" - 16 UNF	3/4" - 16 UNF	1/2"	1/2"
UR3-810	3/4" - 16 UNF	7/8" - 14 UNF	1/2"	5/8"
UR3-812	3/4" - 16 UNF	1.1/16" - 14 UNS	1/2"	3/4"
UR3-108	7/8" - 14 UNF	3/4" - 16 UNF	5/8"	1/2"
UR3-1012	7/8" - 14 UNF	1.1/16" - 14 UNS	5/8"	3/4"
UR3-128	1.1/16" - 14 UNS	3/4" - 16 UNF	3/4"	1/2"
UR3-1210	1.1/16" - 14 UNS	7/8" - 14 UNF	3/4"	5/8"

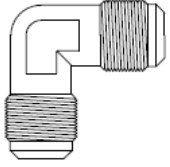
*Flare-to-NPT straight unions*



Part number	Flare Connection SAE J513 Thread ANSI/ASME B1.1		NPT Connection Thread ANSI B1.20.1
	ext thread (male)	ext flare (male)	ext thread (male)
U1-4A	7/16" - 20 UNF	1/4"	NPT 1/8"
U1-4B	7/16" - 20 UNF	1/4"	NPT 1/4"
U1-6B	5/8" - 18 UNF	3/8"	NPT 1/4"
U1-6C	5/8" - 18 UNF	3/8"	NPT 3/8"
U1-8C	3/4" - 16 UNF	1/2"	NPT 3/8"
U1-8D	3/4" - 16 UNF	1/2"	NPT 1/2"
U1-10D	7/8" - 14 UNF	5/8"	NPT 1/2"
U1-12F	1.1/16" - 14 UNS	3/4"	NPT 3/4"
			<b>int thread (female)</b>
U3-4A	7/16" - 20 UNF	1/4"	NPT 1/8"

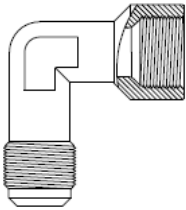
Ordering  
(continued)

*Elbow fittings, male-male Flare*



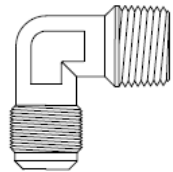
Part number	Thread ANSI/ASME B1.1		Flare Connection SAE J513	
	ext thread (male)	ext thread (male)	ext flare (male)	ext flare (male)
<b>E2-4</b>	7/16" - 20 UNF	7/16" - 20 UNF	1/4"	1/4"
<b>E2-6</b>	5/8" - 18 UNF	5/8" - 18 UNF	3/8"	3/8"
<b>E2-8</b>	3/4" - 16 UNF	3/4" - 16 UNF	1/2"	1/2"
<b>E2-10</b>	7/8" - 14 UNF	7/8" - 14 UNF	5/8"	5/8"
<b>E2-12</b>	1.1/16" - 14 UNS	1.1/16" - 14 UNS	3/4"	3/4"

*Elbow fittings, male-female Flare*



Part number	Thread ANSI/ASME B1.1		Flare Connection SAE J513	
	int thread (female)	ext thread (male)	int flare (female)	ext flare (male)
<b>E3-4</b>	7/16" - 20 UNF	7/16" - 20 UNF	1/4"	1/4"
<b>E3-6</b>	5/8" - 18 UNF	5/8" - 18 UNF	3/8"	3/8"
<b>E3-8</b>	3/4" - 16 UNF	3/4" - 16 UNF	1/2"	1/2"

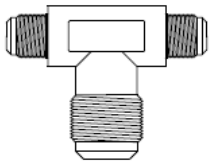
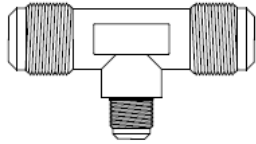
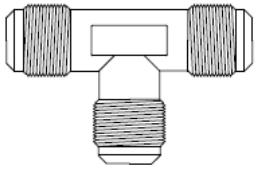
*Flare-to-NPT elbow fittings*



Part number	Flare Connection SAE J513 Thread ANSI/ASME B1.1		NPT Connection Thread ANSI B1.20.1
	ext thread (male)	ext flare (male)	ext thread (male)
<b>E1-4A</b>	7/16" - 20 UNF	1/4"	NPT 1/8"
<b>E1-4B</b>	7/16" - 20 UNF	1/4"	NPT 1/4"
<b>E1-6B</b>	5/8" - 18 UNF	3/8"	NPT 1/4"
<b>E1-6C</b>	5/8" - 18 UNF	3/8"	NPT 3/8"
<b>E1-8C</b>	3/4" - 16 UNF	1/2"	NPT 3/8"
<b>E1-8D</b>	3/4" - 16 UNF	1/2"	NPT 1/2"
<b>E1-10D</b>	7/8" - 14 UNF	5/8"	NPT 1/2"
<b>E1-12F</b>	1.1/16" - 14 UNS	3/4"	NPT 3/4"

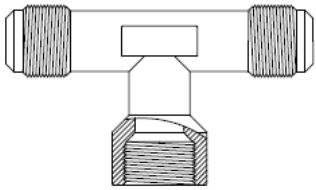
Ordering  
(continued)

*Tee fittings, male-male-male Flare*



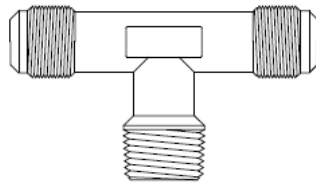
Part number	Thread ANSI/ASME B1.1						Flare Connection SAE J513
	1	ext thread (male)	2	ext thread (male)	3	ext thread (male)	ext-ext-ext flare (male-male-male)
T2-4		7/16" - 20 UNF		7/16" - 20 UNF		7/16" - 20 UNF	1/4"-1/4"-1/4"
TR2-46		7/16" - 20 UNF		5/8" - 18 UNF		7/16" - 20 UNF	1/4"-3/8"-1/4"
TR2-64		5/8" - 18 UNF		7/16" - 20 UNF		5/8" - 18 UNF	3/8"-1/4"-3/8"
T2-6		5/8" - 18 UNF		5/8" - 18 UNF		5/8" - 18 UNF	3/8"-3/8"-3/8"
TR2-68		5/8" - 18 UNF		3/4" - 16 UNF		5/8" - 18 UNF	3/8"-1/2"-3/8"
TR2-86		3/4" - 16 UNF		5/8" - 18 UNF		3/4" - 16 UNF	1/2"-3/8"-1/2"
T2-8		3/4" - 16 UNF		3/4" - 16 UNF		3/4" - 16 UNF	1/2"-1/2"-1/2"
TR2-810		3/4" - 16 UNF		7/8" - 14 UNF		3/4" - 16 UNF	1/2"-5/8"-1/2"
TR2-108		7/8" - 14 UNF		3/4" - 16 UNF		7/8" - 14 UNF	5/8"-1/2"-5/8"
T2-10		7/8" - 14 UNF		7/8" - 14 UNF		7/8" - 14 UNF	5/8"-5/8"-5/8"
TR2-1012		7/8" - 14 UNF		1.1/16" - 14 UNS		7/8" - 14 UNF	5/8"-3/4"-5/8"
TR2-1210		1.1/16" - 14 UNS		7/8" - 14 UNF		1.1/16" - 14 UNS	3/4"-5/8"-3/4"
T2-12		1.1/16" - 14 UNS		1.1/16" - 14 UNS		1.1/16" - 14 UNS	3/4"-3/4"-3/4"

*Tee fittings, male-female-male Flare*

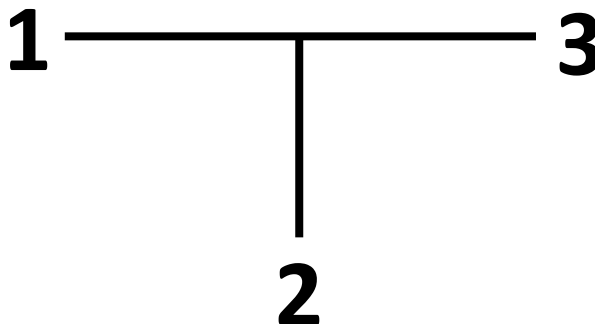


Part number	Thread ANSI/ASME B1.1						Flare Connection SAE J513
	1	ext thread (male)	2	int thread (female)	3	ext thread (male)	ext-int-ext flare (male-female-male)
T6-4		7/16" - 20 UNF		7/16" - 20 UNF		7/16" - 20 UNF	1/4"-1/4"-1/4"

*Flare-to-NPT Tee fittings*



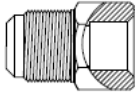
Part number	Thread ANSI/ASME B1.1 Flare SAE J513		NPT Thread ANSI/ASME B1.20.1	Thread ANSI/ASME B1.1 Flare SAE J513		
	1	ext thread (male)	2	ext thread (male)	3	ext thread (male)
T1-4A		7/16" - 20 UNF SAE Flare 1/4"	NPT 1/8"			7/16" - 20 UNF SAE Flare 1/4"
T1-4B		7/16" - 20 UNF SAE Flare 1/4"	NPT 1/4"			7/16" - 20 UNF SAE Flare 1/4"





Ordering  
(continued)

Flare-to-solder straight unions



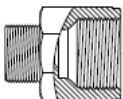
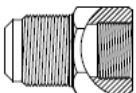
Part number	Flare Connection SAE J513 Thread ANSI/ASME B1.1		ODF Connection	
	ext thread (male)	ext flare (male)	mm	inch
US3-44	7/16" - 20 UNF	1/4"	-	1/4"
US3-4M8	7/16" - 20 UNF	1/4"	8	-
US3-66	5/8" - 18 UNF	3/8"	-	3/8"
US3-6M10	5/8" - 18 UNF	3/8"	10	-
US3-8M12	3/4" - 16 UNF	1/2"	12	-
US3-88	3/4" - 16 UNF	1/2"	-	1/2"
US3-1010	7/8" - 14 UNF	5/8"	16	5/8"
US3-12M18	1.1/16" - 14 UNS	3/4"	18	-

Flare-to-solder swivel nut + adapter



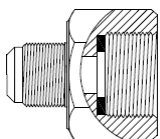
Part number	Thread ANSI/ASME B1.1	Flare connection SAE J513	Tube diameter		Tightening torque
	int thread (female)		mm	inch	Nm (lbf-ft)
NGR-4M6	7/16" - 20 UNF	1/4"	6	-	11÷14 (8÷10)
NGR-4	7/16" - 20 UNF	1/4"	-	1/4"	11÷14 (8÷10)
NGR-6	5/8" - 18 UNF	3/8"	-	3/8"	20÷25 (15÷18.5)
NGR-6M10	5/8" - 18 UNF	3/8"	10	-	20÷25 (15÷18.5)
NGR-8M12	3/4" - 16 UNF	1/2"	12	-	34÷47 (25÷34.5)
NGR-8	3/4" - 16 UNF	1/2"	-	1/2"	34÷47 (25÷34.5)
NGR-10	7/8" - 14 UNF	5/8"	16	5/8"	54÷75 (40÷55)
NGR-12M18	1.1/16" - 14 UNS	3/4"	18	-	68÷71 (50÷52)
NGR-12	1.1/16" - 14 UNS	3/4"	19	3/4"	68÷71 (50÷52)
NGR-14	1.1/4" - 12 UNF	7/8"	22	7/8"	90÷120 (66÷98)

Flare-to-BSP / Flare-to-GAS straight unions



Part number	Flare Connection SAE J513 Thread ANSI/ASME B1.1		BSP Connection Thread GAS ISO 228	
	ext thread (male) ext flare (male)	int thread (female) int flare (female)	ext thread (male)	int thread (female)
UP3-4G4F	7/16" - 20 UNF external Flare 1/4"	-	-	GAS f-1/4"
UP3-4G4M	-	7/16" - 20 UNF internal Flare 1/4"	GAS m-1/4"	-

Bottle adaptors: SAE Flare-to-BSW / SAE Flare-to-Withworth



Part number	Flare Connection SAE J513 Thread ANSI/ASME B1.1	BSW Connection Thread Withworth BS 84	Notes
	ext thread (male) ext flare (male)	int thread (female)	
U3X-4DX	7/16" - 20 UNF Flare 1/4"	W21,8-14 (right hand thread)	The adaptors are supplied with a Teflon® (PTFE) gasket inside.
U3X-4SX	7/16" - 20 UNF Flare 1/4"	W20-14 (left hand thread)	
U32-4SX **	7/16" - 20 UNF Flare 1/4"	W21,8-14 (left hand thread)	

\*\* Adapter U32-4SX is specific for R32 refrigerant bottles.

## Access valves



## Access valves

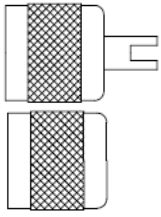


## Access valves



### Ordering

(continued)



Brass caps for access valves

Part number	Thread	Tightening torque	Notes
	ANSI/ASME B1.1 int thread (female)		
<b>CAP-02</b>	7/16" - 20 UNF	Hand tight	With wrench for internal mechanism.
<b>CAP-03</b>	7/16" - 20 UNF	Hand tight	Without wrench for internal mechanism.

**Note:** Caps are made in nickel-plated brass and are supplied with an internally pre-assembled gasket (not o-ring).

Internal mechanisms



Part number	Temperature range	Maximum working pressure, PS	Tightening torque
	°C (°F)	bar (psi)	Nm (lbf·ft)
<b>MC-02</b>	-40 ÷ +100 (-40 ÷ +212) Pick 30sec: +130 (+266)	Static: 140 (2 030) Operating: 60 (870)	0,4 ÷ 0,5 (3.5 ÷ 4.4)
<b>MC-04</b>	-40 ÷ +150 (-40 ÷ +300)	Static: 140 (2 030) Operating: 60 (870)	0,4 ÷ 0,5 (3.5 ÷ 4.4)
<b>MC-05</b>	-40 ÷ +100 (-40 ÷ +212) Pick 30sec: +130 (+266)	Static: 40 (580) Operating: 28 (406)	0,4 ÷ 0,5 (3.5 ÷ 4.4)
<b>MC-06</b>	-35 ÷ +100 (-31 ÷ +212) Pick 30sec: +125 (257)	Static: 40 (580) Operating: 28 (406)	0,3 ÷ 0,35 (2.6 ÷ 3.1)

**Note:** Schrader mechanisms can be supplied pre-assembled into valves and access fittings, upon request.



### Recommended fitting conditions

To prevent damage to the mechanism, remove the same before brazing.

### Pressure resistance

**Operating pressure** is the maximum pressure under which the core plunger can be operated without being deteriorated during the opening-closing movement, while **static pressure** is the maximum pressure under which the mechanism can safely still in the closed position during its life. It may be called also *Working pressure*.

### Refrigerants compatibility

All IGLOO internal mechanisms are suitable for refrigerants HCFC, HFC and R744 (CO<sub>2</sub>). Mechanisms MC-02 and MC-04 are suitable also for applications up to 140bar (2 030psi).

### Lubricants compatibility

All IGLOO internal mechanisms are suitable for lubricants PAG, POE and MO (mineral oil).

### Typical applications

**MC-02** is the latest design, highly recommended for all the most typical applications due to its quality/price ratio. External seal: PTFE, Internal seal: CR.

**MC-04** is recommended for automotive A/C (due to its chemical resistance to fluids commonly used into cars) and for applications where high-temperature resistance is a key factor. External seal: PTFE, Internal seal: HNBR.

**MC-05** and **MC-06** are the cheapest and the most commonly used mechanisms for a number of applications in commercial refrigeration and air-conditioning:

- **MC-05** has an external spring, and consequently an higher flow-rate. External seal: PTFE, Internal seal: CR.

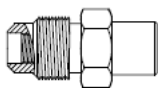
- **MC-06** has an internal spring, and consequently easier/stronger to handle. External seal: PTFE, Internal seal: CR.

Straight access fittings

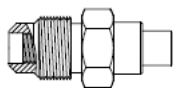
Part number	Flare conn. SAE J513 Thread ANSI/ASME B1.1 with mechanism seat		IDS Connections size of the internal diameter of the copper tube to be brazed		ODF Connections (aka ODS) size of the external diameter of the copper tube to be brazed		Threaded Connection withouth mechanism seat
	ext thread (male)	ext flare (male)	mm	inch	mm	inch	
UC-01	7/16" - 20 UNF	1/4"	-	3/8" (9,52mm)	6mm	-	-
UC-02	7/16" - 20 UNF	1/4"	-	-	-	-	7/16" - 20 UNF ext Flare 1/4" (male)
UC-03	7/16" - 20 UNF	1/4"	8mm 10mm	-	6mm	-	-
UC-4A	7/16" - 20 UNF	1/4"	-	-	-	-	NPT 1/8" ext (male)
UC-4B	7/16" - 20 UNF	1/4"	-	-	-	-	NPT 1/4" ext (male)
UC-4C	7/16" - 20 UNF	1/4"	-	-	-	-	NPT 3/8" ext (male)
UC-05	7/16" - 20 UNF	1/4"	8mm	1/4" (6,35mm) 3/8" (9,52mm)	5mm	-	-
UC-06	7/16" - 20 UNF	1/4"	6mm	-	-	-	-
UC-07	1/2" - 20 UNF	5/16"	7mm	3/8" (9,52mm)	-	-	-
UC-08	1/2" - 20 UNF	5/16"	6mm	3/8" (9,52mm)	-	-	-
UC-09	7/16" - 20 UNF	1/4"	-	3/8" (9,52mm)	-	1/4" (6,35mm)	-
UC-10	7/16" - 20 UNF	1/4"	-	-	-	-	7/16" - 20 UNF int Flare 1/4" (female)

Part number	Flare conn. SAE J513 Thread ANSI/ASME B1.1 with mechanism seat	Copper tube	
	ext thread (male) ext flare (male)	External diameter	Lengths
UC-01X50	7/16" - 20 UNF ext flare 1/4" (male)	6mm	Tube lenght 50mm (2") Total lenght 76mm (3")
UC-01X100	7/16" - 20 UNF ext flare 1/4" (male)	6mm	Tube lenght 100mm (4") Total lenght 126mm (5")

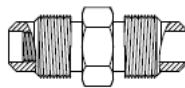
**Note:** All the access fittings can be supplied with a brazed copper tube of any lenght, internal mechanism and/or cap pre-assembled.



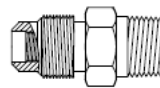
UC-01  
UC-06  
UC-09



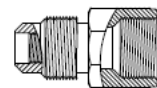
UC-03  
UC-05  
UC-07  
UC-08



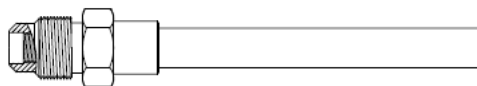
UC-02



UC-4A  
UC-4B  
UC-4C



UC-10



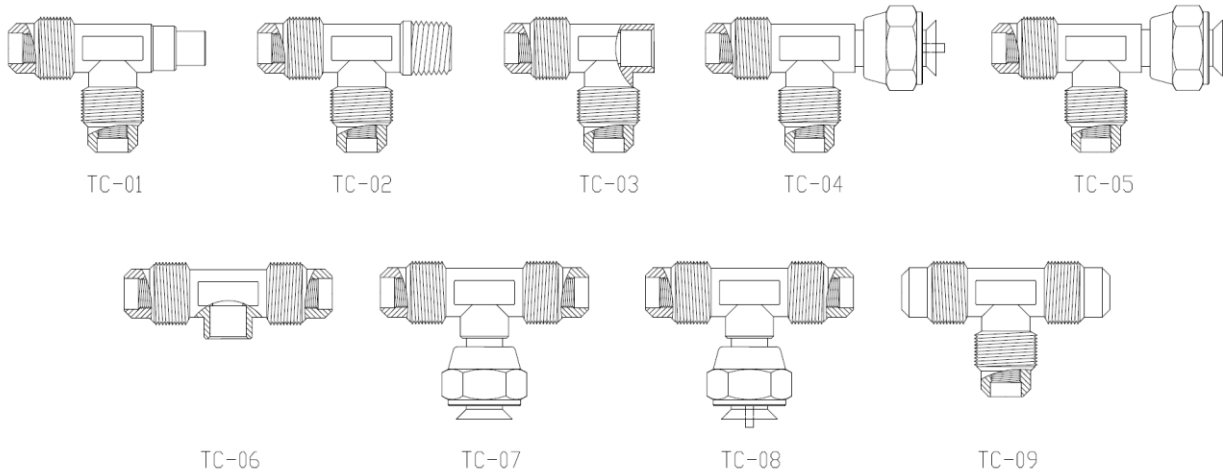
UC-01X50  
UC-01X100

Tee access fittings

Part number	2x ext thread (male)	Flare conn. SAE J513 Thread ANSI/ASME B1.1 with mechanism seat ext flare (male)	IDS Connections size of the internal diameter of the copper tube to be brazed		ODF Connections (aka ODS) size of the external diameter of the copper tube to be brazed		Threaded Connection without mechanism seat
			mm	inch	mm	inch	
TC-01	7/16" - 20 UNF	1/4"	6	3/8" (9,52mm)	-	-	-
TC-02	7/16" - 20 UNF	1/4"	-	-	-	-	NPT 1/8" ext (male)
TC-03	7/16" - 20 UNF	1/4"	-	-	6	-	-
TC-04	7/16" - 20 UNF	1/4"	-	-	-	-	Swivel nut 1/4" with percussor
TC-05	7/16" - 20 UNF	1/4"	-	-	-	-	Swivel nut 1/4" without percussor
TC-06	7/16" - 20 UNF	1/4"	-	-	6	-	-
TC-07	7/16" - 20 UNF	1/4"	-	-	-	-	Swivel nut 1/4" without percussor
TC-08	7/16" - 20 UNF	1/4"	-	-	-	-	Swivel nut 1/4" with percussor

Part number	1x male thread	Flare conn. SAE J513 Thread ANSI/ASME B1.1 with mechanism seat		2x	Flare conn. SAE J513 Thread ANSI/ASME B1.1 without mechanism seat
		male thread	male flare		
TC-09	7/16" - 20 UNF		1/4"		7/16" - 20 UNF Ext Flare 1/4" (male)

Note: All the access fittings can be supplied with a brazed copper tube of any length, internal mechanism and/or cap pre-assembled.



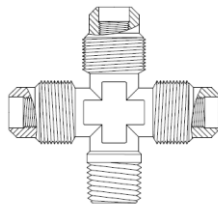
## Access valves



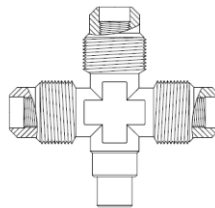
### Cross access fittings

Part number	3x	Flare conn. SAE J513 Thread ANSI/ASME B1.1 with mechanism seat	IDS Connections		Threaded connection without mechanism seat
			size of the internal diameter of the copper tube to be brazed		
	male thread	male flare	mm	inch	
CC-01	7/16" - 20 UNF	1/4"	-	-	NPT 1/8" ext (male)
CC-02	7/16" - 20 UNF	1/4"	-	-	NPT 1/4" ext (male)
CC-03	7/16" - 20 UNF	1/4"	6	-	-
CC-04	7/16" - 20 UNF	1/4"	-	-	Swivel nut SAE Flare 1/4"

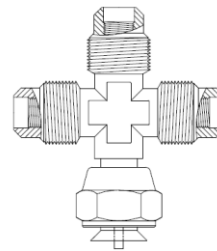
**Note:** All the access fittings can be supplied with a brazed copper tube of any length, internal mechanism and/or cap pre-assembled.



CC-01  
CC-02



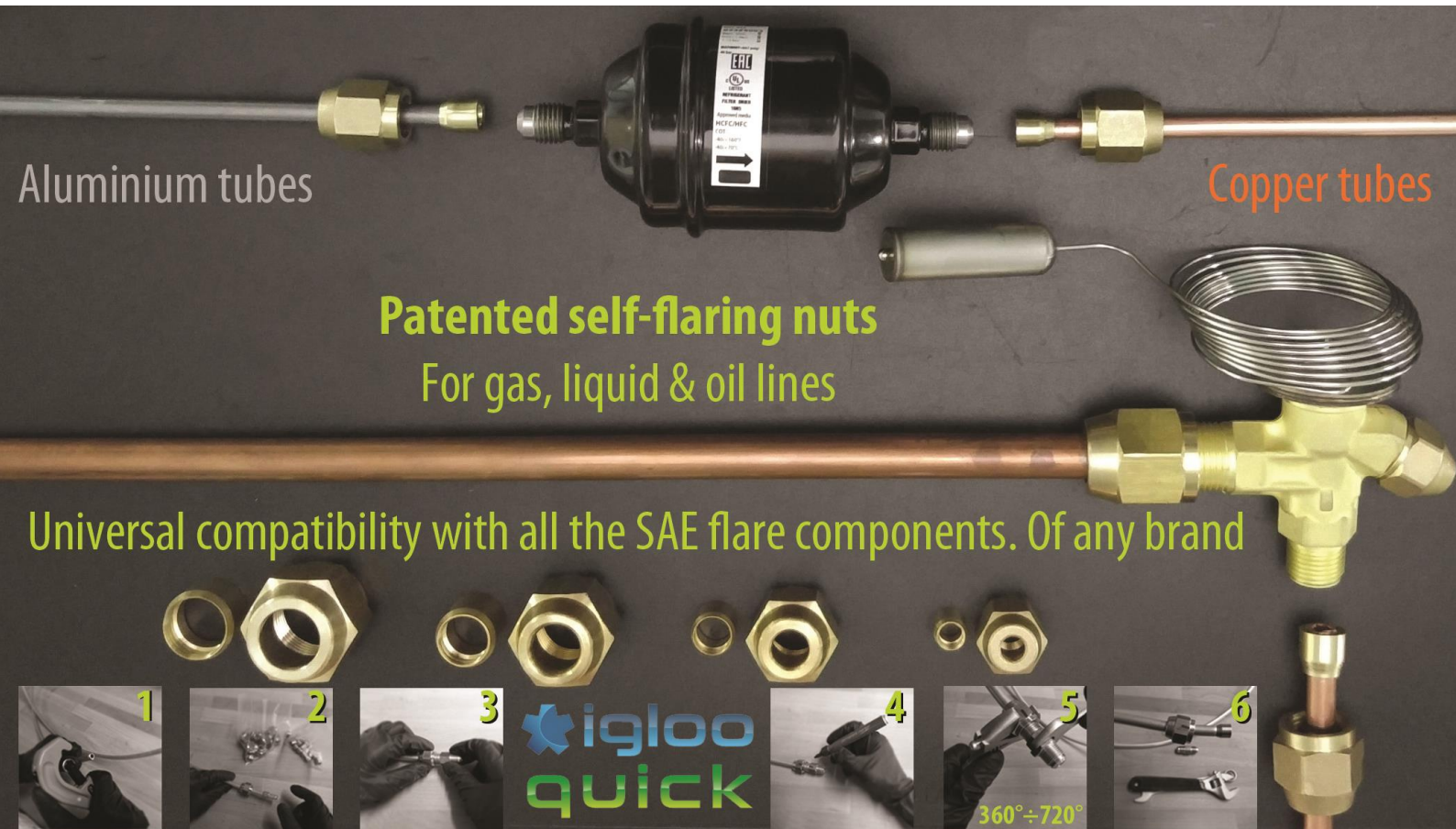
CC-03



CC-04

# Self flare nuts and fittings

safer and faster than brazing



Aluminium tubes

Copper tubes

**Patented self-flaring nuts**  
For gas, liquid & oil lines

Universal compatibility with all the SAE flare components. Of any brand

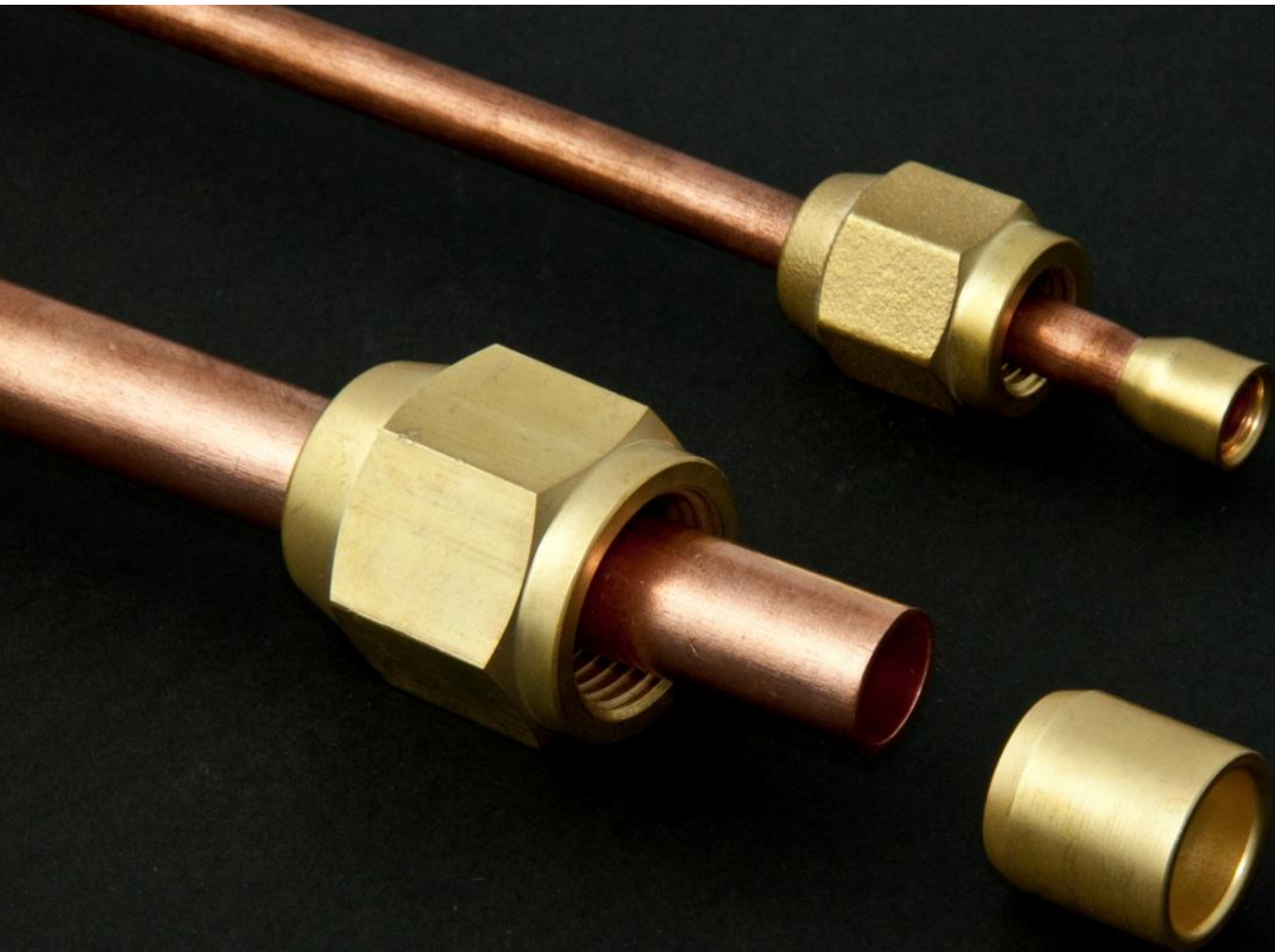


360° ÷ 720°



## Self flare nuts and fittings

safer and faster than brazing



IGLOO QUICK nuts allow the union of tubes in a few seconds: just push-in the tube and screw 1 and ½ turn with a common wrench. Flaring tool and dinometric wrench are not required.

Tests made in conformity to European Safety and Environment Normative EN 378 demonstrate that can also be used as a reliable alternative to brazing, for instance for assembly in presence of explosive atmosphere, to connect domestic split systems (also with aluminium tubes), or by OEMs in the mass production of air-conditioners or refrigerating units for instance to assembly filter driers, expansion valves and components in the oil line (see the picture in the page before).

IGLOO QUICK nuts are very versatile and can be used with metric or inch tubes of any thickness made of aluminium or copper.

The metal seal and the maximum working pressure of 45 bar make this product suitable for air-conditioning and refrigeration systems charged with new refrigerants operating at higher pressures.

**Charateristics**

- Fluid temperature: from -40°C to +150°C
- Maximum working pressure: 45 bar
- Suitable for all refrigerants HCFC, HFC e R744 (CO<sub>2</sub>) and oils
- Metal sealing
- Universal compatibility with all the SAE threaded fittings, valves, vessels, etc.
- No need to calibrate, flare, braze the tube
- No need of dinamometric wrench or special tools: just a common wrench

**Approvals**

- CE (PED, RoHS, REACH), EAC
- Performances higher than requirements of UL 109, DIN 8912 and SAE J513
- Patented system

**Technical data**

Can be used with all refrigerants HCFC, HFC e R744 (CO<sub>2</sub>) and oils. Not suitable with ammonia NH<sub>3</sub>.

Guaranteed for a leakrate under 50 milligrams/year of refrigerant and can be used as substitute of brazed joints and flared fittings: are universally compatible with all the SAE components on the market, from any brand.

*For metric or inch tubes of any thickness made of aluminium or copper.*

<b>SFC Series</b>	Self flare nuts	-40 ÷ +150 °C	45bar (650psi)
<b>SFL Series</b>	Self flare straight unions		

**Standard supply**

IGLOO QUICK nuts (SFC Series) are made of 2 parts supplied in 1 bag of 10 pcs/each. Bags are packaged into carton boxes of 100 pieces.

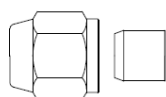
IGLOO QUICK unions (SFL Series) are made of 1 SAE Flare straight union + 2 IGLOO QUICK nuts and comes already assembled from the factory supplied in 1 bag of 10 pcs/each. Bagas are packaged into carton boxes of 100 pieces.

**Ordering**

*Universally compatible with all the SAE components on the market, from any brand.*

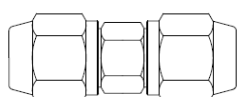
**Self flare nuts. SFC Series**

Part number	Thread ANSI/ASME B1.1	Flare connection SAE J513	Tube diameter	
	int thread (female)		mm	inch
<b>SFC-4</b>	7/16" - 20 UNF	1/4"	6	1/4"
<b>SFC-6</b>	5/8" - 18 UNF	3/8"	10	3/8"
<b>SFC-8</b>	3/4" - 16 UNF	1/2"	12	1/2"
<b>SFC-10</b>	7/8" - 14 UNF	5/8"	16	5/8"

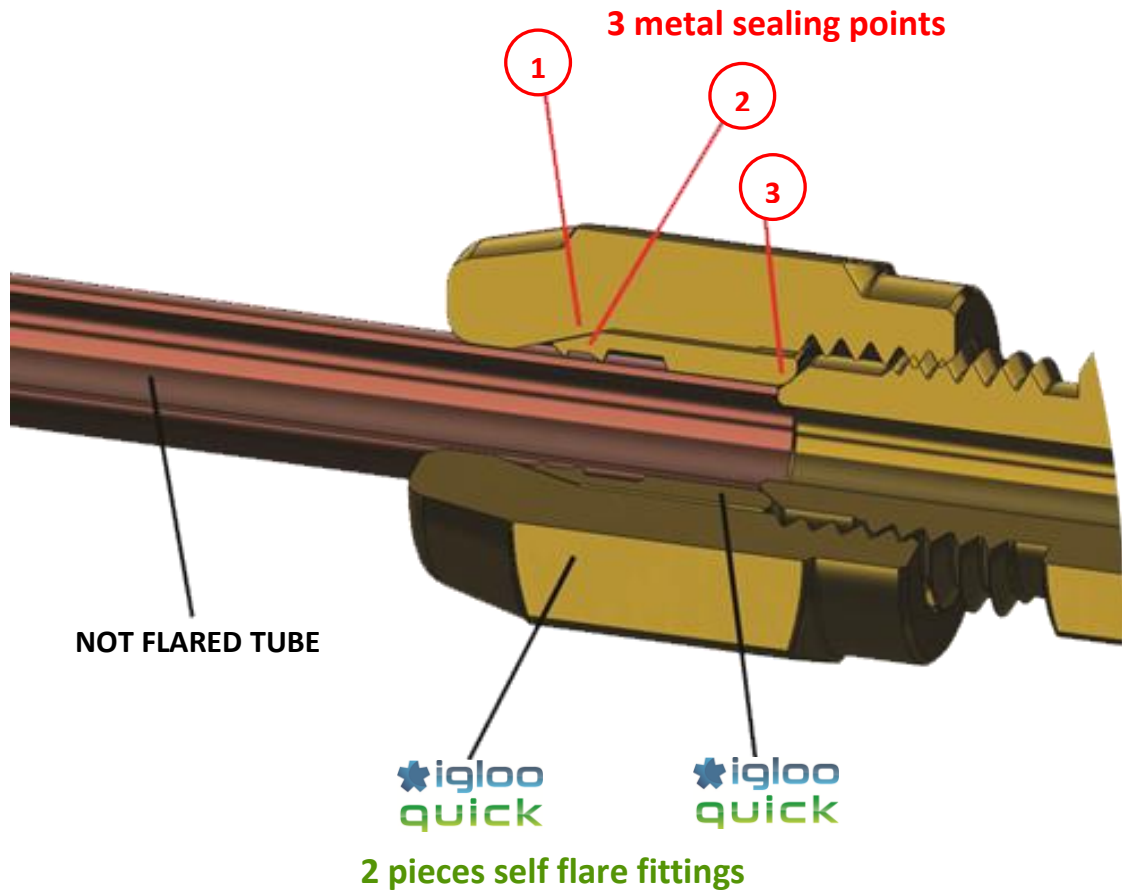


**Self flare straight unions. SFL Series**

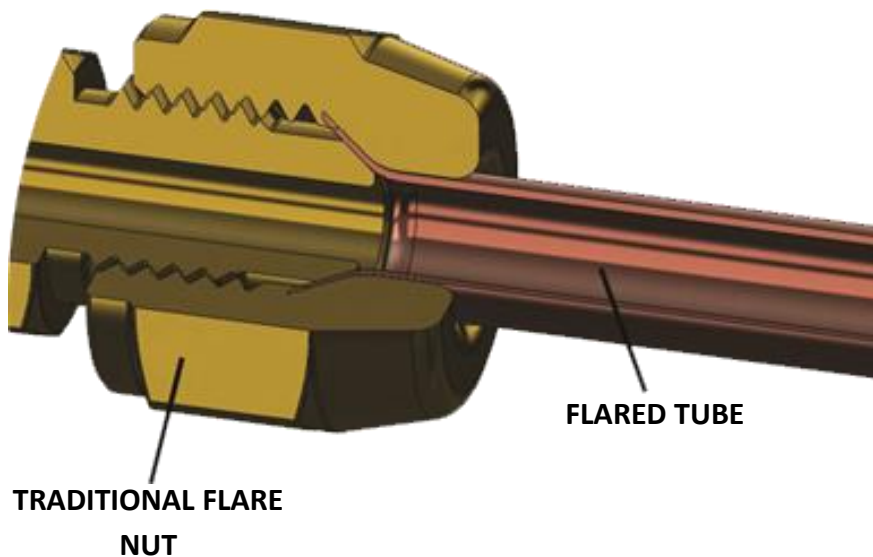
Part number	Flare connection SAE J513	Tube diameter	
		mm	inch
<b>SFL-4</b>	1/4"	6	1/4"
<b>SFL-6</b>	3/8"	10	3/8"
<b>SFL-8</b>	1/2"	12	1/2"
<b>SFL-10</b>	5/8"	16	5/8"



**IGLOO QUICK fittings are suitable for metric/inch tubes of any thickness made of copper or aluminium.**



**Traditional flare fittings need a flared tube made of copper and can't be used with aluminium tubes.**



### Triple metal sealing:

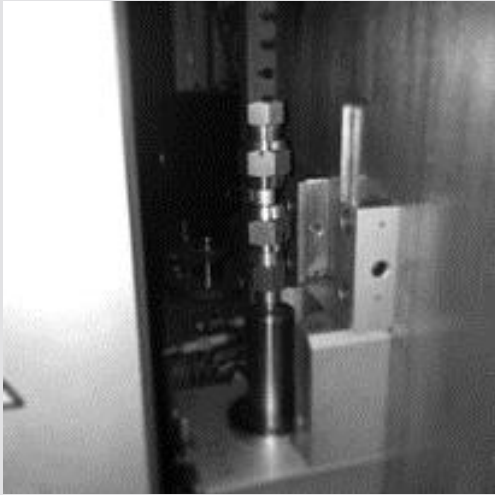
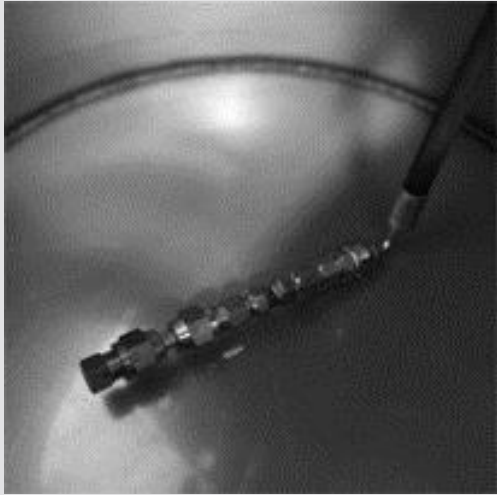
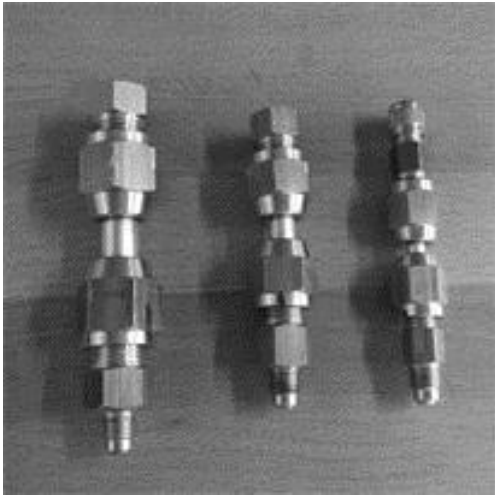
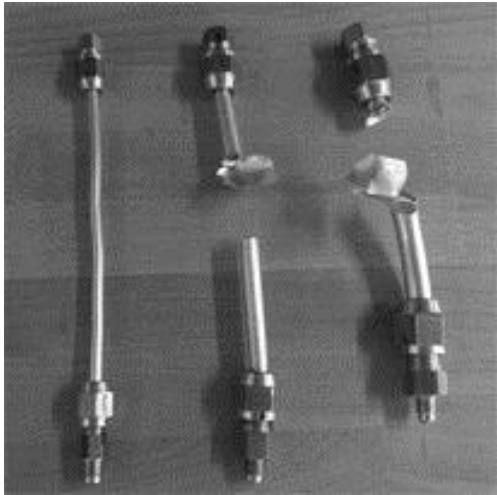
**Sealing point 1** The bonding action of the IGLOO QUICK fitting impresses on the external circular surface of the tube a radial force that creates a **metal sealing** surface between the fitting and the tube, independently from the thickness of the tube. When the IGLOO QUICK fitting is tightened on the tube the risk to bit excessively and crack the tube is avoided by the internal geometry of the biting ring, that presents 2 small teeth with rounded edges that clamp the tube jointly deforming it radially in the typical cross-section shown in the picture below. The maximum working pressure is 45 bar and it has been burst tested up to 200 bar.

**Sealing point 2** When IGLOO QUICK fitting is tightened the biting ring is pushed against the external threaded (male) connection: just 1 turn and 1/2 is enough to create a leak-proof **metal sealing**.

**Sealing point 3** During the locking of the IGLOO QUICK fitting the biting ring is pressed by the nut against the fitting and, due to its elasticity, the reaction force created guarantees a very strong **metal sealing** and gives to the joint an important property that you can't find in traditional fittings: the resistance to loose. This unscrewing resistance due to biting ring's elasticity makes the fitting resistant even to the harder working conditions such as vibrations, hammer effect, temperature cycles, etc..

### Cross section magnification:



	Leak test	Burst test (pressure)
<b>Normative</b>	EN 1779.B6	EN 378-2
<b>Description</b>	During this test it is measured the leakrate of the joint expressed in gram/year of refrigerant. The recommended maximum leakrate is of 1 gram/year of refrigerant.	This test measure the pressure resistance of the joints, that shall resist - without loose the tube - at least at 4 times (180 bar) the maximum working pressure (45 bar).
<b>Machinery</b>	<p>Leak testing machine that uses Helium as tracing gas, with a mass spectrometer sniffer operating in a high vacuum chamber.</p> <p>The sensibility of the sniffer used is of about 1 milligram/year of refrigerant.</p> 	<p>High pressure air compressor (200 bar) and sealed stainless steel box to cointain the specimens and protect the personnel from an eventual burst of the parts under pressure.</p> 
<b>Results</b>	<p>✓ It has been measured a leakrate under 50 milligrams/year of refrigerant, equivalent to 1 gram of refrigerant in over 20 years.</p> 	<p>✓ The fittings resisted to the burst of the tubes remaining perfectly intact up to the maximum testing pressure (200 bar) without loosing the tube.</p> 

**Assembly instructions  
(part 1 of 2)**

**1. Cut the tube to length.**

*Note: Accurate calibration of the tube diameter is not strictly necessary.*



**2. Push-in the 2 pieces of IGLOO QUICK fitting on the tube.**



**3. Hand tighten the IGLOO QUICK fitting without using tools.**

*Note: Lubricating the contact surfaces of the 2 pieces of IGLOO QUICK fitting results in a stronger joint.*



Assembly instructions  
(part 2 of 2)

4. Mark with a pen the initial position of the IGLOO QUICK fitting.



5. Tighten the IGLOO QUICK fitting for 1 and 1/2 turn with a common wrench.  
*Note: Don't use a dinamometric wrench.*



**Attention:** To avoid leaks or failure is important tighten the IGLOO QUICK fitting as indicated: **1 turn and 1/2**

6. Inspect the joint: unscrew the IGLOO QUICK fitting and repeat the steps from 3 to 5: at step 5 tighten the joint with a common wrench for not more than 1/4 of turn (90°). *Note: Don't use a dinamometric wrench.*



**Attention:** To avoid leaks or failure is important tighten the IGLOO QUICK fitting as indicated: **1/4 of turn**