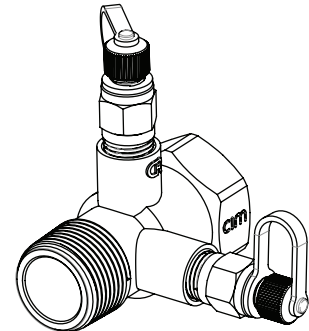


TECHNICAL DATA SHEET

**FLOW MEASUREMENT  
DEVICE**

**cim 721**

**PN 20**



**Main features:**

Cim 721 is used for measuring the flow in cooling, heating and domestic water systems.  
Cim 721 is a fixed orifice measurement device with following features:

- Made according to BS 7350 standard;
- Supplied with 2 pcs. of measuring nipples for needles;
- Measuring accuracy of fixed orifice  $\pm 5\%$ .

It is supplied with internal thread.

It is made of "CR" brass ("CR" - Corrosion Resistant).

This article is made in compliance with the quality management requirements of ISO 9001:2008 standard.

All articles are tested according to the EN 12266-1:2003 standard.

It can be used in a wide variety of sectors: heating, air conditioning, water, sanitary systems and generally with any non corrosive liquid.

**Technical data:**

Max. static working pressure	20 bar
Max. flow temperature	120 °C
Min. temperature	-10°C
Fluids:	Water and Glycol
Material of parts in contact with water:	

Body;  
Test points.

Materials:

"CR"Brass (EN 12165-CW602N-M)

Threads:

ISO 7

**Approved by\*:**

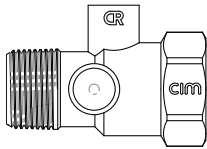
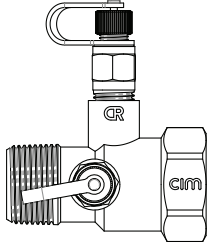


\*Cim 721

Rev.3 del 03/2015

TECHNICAL DATA SHEET

Models:



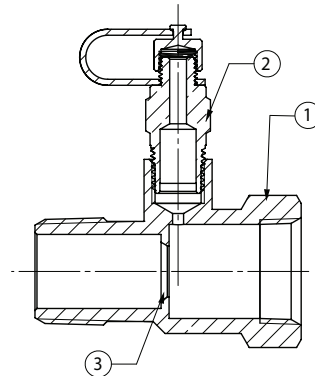
Cim 721 - Flow measurement device - PN 20 - "CR" Brass				
DN	Material	Thread	Kvs	Technical Code
15UUL	CR Brass EN 12165-CW602N-M	1/2" Rp	0.1	HA00700999
15ULL		1/2" Rp	0.17	HA00701000
15UL		1/2" Rp	0.23	HA00701001
15L		1/2" Rp	0.47	HA00701002
15M		1/2" Rp	0.98	HA00701004
15		1/2" Rp	1.80	HA00701015
20		3/4" Rc	4.06	HA00701020
25		1" Rc	7.45	HA00701025
32		1 1/4 Rc	16.63	HA00701032
40		1 1/2 Rc	23.00	HA00701040
50		2" Rc	47.35	HA00701050

Cim 722 - Flow measurement device - PN 20 - "CR" Brass - without test points				
DN	Material	Thread	Kvs	Technical Code
15UUL	CR Brass EN 12165-CW602N-M	1/2" Rp	0.1	HA00700999
15ULL		1/2" Rp	0.17	HA00701000
15UL		1/2" Rp	0.23	HA00701001
15L		1/2" Rp	0.47	HA00701002
15M		1/2" Rp	0.98	HA00701004
15		1/2" Rp	1.80	HA00701015
20		3/4" Rc	4.06	HA00701020
25		1" Rc	7.45	HA00701025
32		1 1/4 Rc	16.63	HA00701032
40		1 1/2 Rc	23.00	HA00701040
50		2" Rc	47.35	HA00701050

## TECHNICAL DATA SHEET

### Cross section

1. Body
2. Test port
3. Calibrated orifice



### Installation procedure

Before installation of Cim 721, check that inside the valve and the pipes there is no foreign matters which might damage the tightness of binder points or cause turbulences to the water flow.

When installing the flow measurement device, please make sure to have a pipe length 5 times the DN upstream the valve and pay attention to the arrow direction casted on the valve body, which shall be the same as the flow one.

To regulate flow rate, Cim 721 can be coupled with a balancing valve (f.i. Cim 727); in this case, it shall be screwed on the inlet screwed end of said valve. If Cim 721 is installed by itself and not with a regulating valve, make sure to have downstream a pipe length 2 times the DN.

Burr pipe connections after having threaded them and distribute the sealing material on pipe threads only and not on valve threads.

Make sure that pipe threading length is not longer than valve threads.

If installed horizontally, Cim 721 should have binder points faced up at 45° to avoid any deposit, which might block holes of binder points. In case of ceiling installation, and consequently with no possibility of such assembling (lack of enough room for sensors insertion), Cim 721 can be installed with binder points downward, but always at 45°. If Cim 721 is installed vertically, all positions are accepted, but always taking into account the connection to a differential manometer: the insertion of sensors of this manometer needs at least 100mm of free area along the axe of each binder point.

### Differential pressure and flow rate reading

Unscrew the plugs of binder points placed on the fixed orifice ends of the valve and insert the sensors of differential manometer Cim 726, pressing the measuring needle until the perforation of tightening rubber.

The colour of binder point straps means the following:

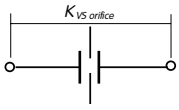
- Red strap: the value registered in this point means the upstream pressure of fixed orifice;
- Blue strap: the value registered in this point means the downstream pressure of fixed orifice.

If Cim 726 device is not available, differential pressures and relevant flow rate can be read in the diagrams reported on following pages (see "Graphs and Tables").

When measuring is over, remove measuring needles carefully, for some splash of water might come out. Replace the plugs of binder points.

## TECHNICAL DATA SHEET

### Sizing:



Kvs orifice - Kv across orifices

Relative density	
Fluid	r
Water	1.000
Water and glycol 10%	1.012
Water and glycol 20%	1.028
Water and glycol 30%	1.040
Water and glycol 40%	1.054
Water and glycol 50%	1.067

### FLOW COEFFICIENT

Kv, in metric system represents the flow in m<sup>3</sup>/h of water at the temperature of 15.5°C (density = 998 kg/m<sup>3</sup>) which causes a pressure drop of 1 bar. In the USA flow coefficient is called Cv (Kv = 0.865 Cv).

$$Kv = \frac{Q}{\sqrt{\Delta p}}$$

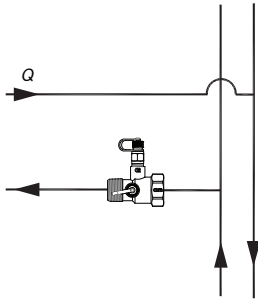
It is possible calculate the pressure drop across a valve with a generic flow rate and fluid:

$$\Delta p = r \cdot \left( \frac{Q}{kv} \right)^2$$

where:

r is the relative density, Q is the flow rate in m<sup>3</sup>/h.

TECHNICAL DATA SHEET



EXAMPLE

It is required to measure the flow rate of the circuit in the figure, the given data are:

- Design flow rate:  $Q = 3 \text{ m}^3/\text{h} = 0.833 \text{ l/s}$ .

In order to measure the differential pressure it is required at least 1 kPa and as maximum 50 kPa. It is possible to calculate the measuring differential pressure using the following relation:

$$\Delta p_{bin} = r \cdot \left( \frac{Q}{Kvs} \right)^2$$

Using the attached tables to this datasheet, it is possible to find the following available measurement devices:

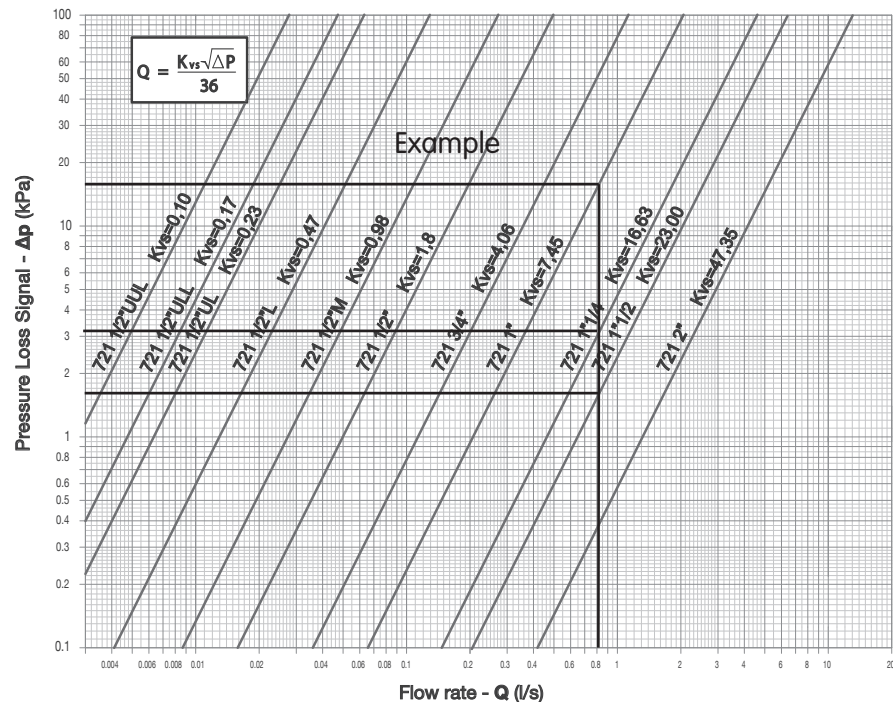
- Cim 721 DN 25 --> 16.21 kPa ( $Kvs=7.45$ );
- Cim 721 DN 32 --> 3.25 kPa ( $Kvs=16.63$ );
- Cim 721 DN 40 --> 1.70 kPa ( $Kvs=23.00$ ).

SUGGESTED VALUES AND TIPS:

- Pressure drop across the binders:  
Max = 50 kPa  
Min = 1 kPa
- Velocities in the pipeline:  
Max = 1.15 m/s  
Min = 0.75 m/s

The three selected models are comparable. As a general rule, it is better to choose the measurement device that has a low value of pressure drop, in order to avoid problems concerning noises.

In this case it is possible to select the DN 32 that has a good compromise in terms of differential pressures.



**TECHNICAL DATA SHEET**

**Measurement conversion chart:**

**Pressure**

FROM	MULTIPLY BY	TO OBTAIN
Pa, Pascal	0,001	kPa, kiloPascal
Pa, Pascal	0,000001	MPa, Mega Pascal
Pa, Pascal	0,00001	bar
Pa, Pascal	0,00010972	m <sub>H2O</sub> , metres of water
Pa, Pascal	0,000145038	psi, pound per square inch
bar	1,01325	atm, atmosphere
bar	0,980665	Kg/cm <sup>2</sup> , kilograms per square centimetre
bar	10,1972	m <sub>H2O</sub> , metres of water
bar	14,5038	psi, pound per square inch
atm, atmosphere	1,03323	Kg/cm <sup>2</sup> , kilograms per square centimetre
atm, atmosphere	10,3323	m <sub>H2O</sub> , metres of water
atm, atmosphere	14,6959	psi, pound per square inch
Kg/cm <sup>2</sup>	10	m <sub>H2O</sub> , metres of water
Kg/cm <sup>2</sup>	14,2233	psi, pound per square inch
m <sub>H2O</sub>	1,42233	psi, pound per square inch

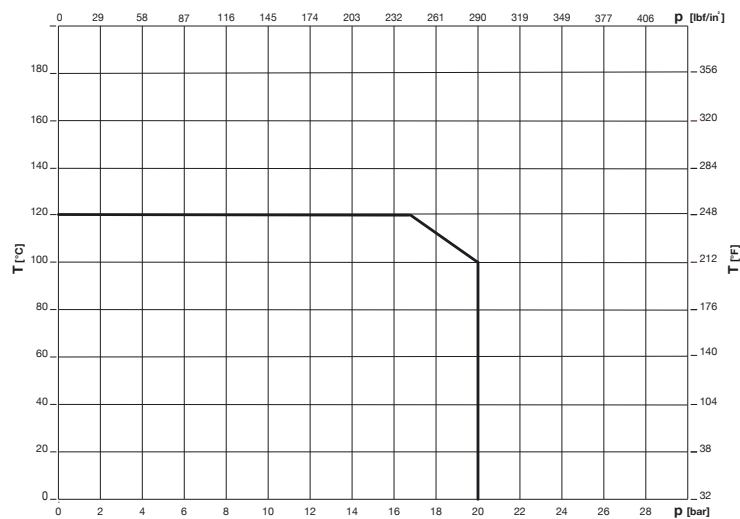
← TO OBTAIN      DIVIDE BY      FROM →

**Length, Area, Volume, Density**

FROM	MULTIPLY BY	TO OBTAIN
inches	0,0254	m, metres
inches	2,54	cm, centimetres
feet	0,3048	m, metres
feet	30,48	cm, centimetres
yards	0,9144	m, metres
square inches	0,00064516	m <sup>2</sup> , metri quadrati
square feet	0,09290304	m <sup>2</sup> , square metres
square inches	6,4516	cm <sup>2</sup> , square centimetres
square feet	929,0304	cm <sup>2</sup> , square centimetres
square yards	0,8361274	m <sup>2</sup> , square metres
l, litres	0,001	m <sup>3</sup> , cubic metres
gallons	0,003789412	m <sup>3</sup> , cubic metres
cubic yards	0,7645549	m <sup>3</sup> , cubic metres
cubic feet	0,02831685	m <sup>3</sup> , cubic metres
cubic inches	0,0000164	m <sup>3</sup> , cubic metres
cubic inches	16,38706	cm <sup>3</sup> , cubic centimetres
cubic feet	28,31685	l, litres
gallons	3,785412	l, litres

← TO OBTAIN      DIVIDE BY      FROM →

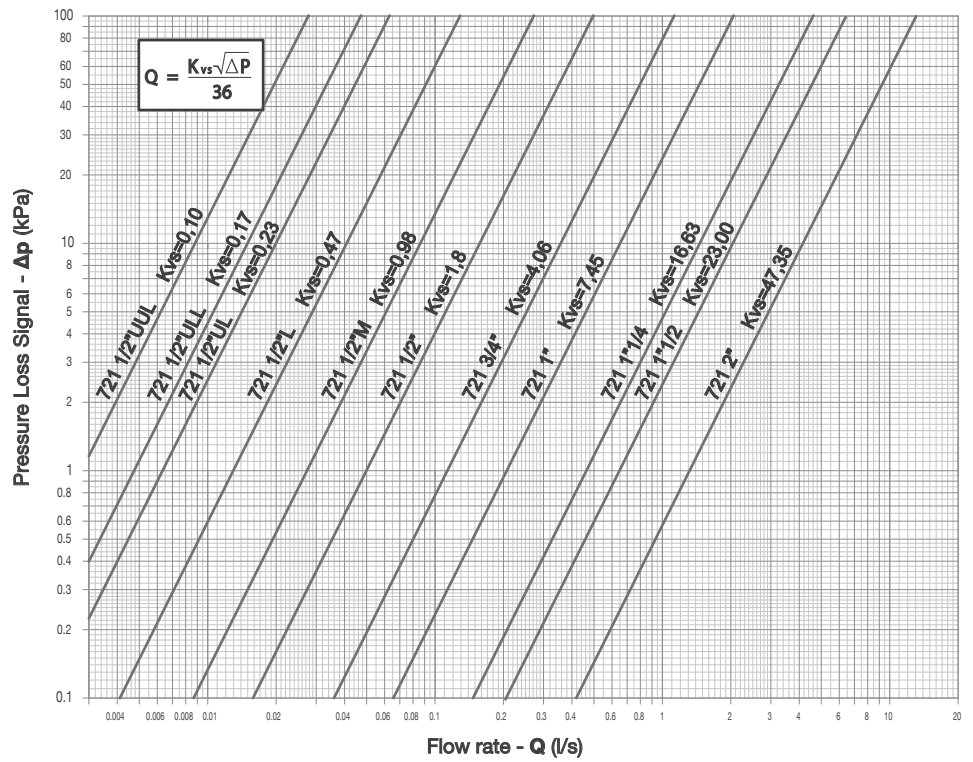
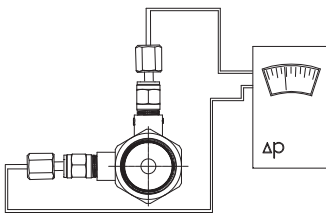
**Pressure-temperature ratings:**



TECHNICAL DATA SHEET

**Kv Values**

Cim 721  
Cim 722

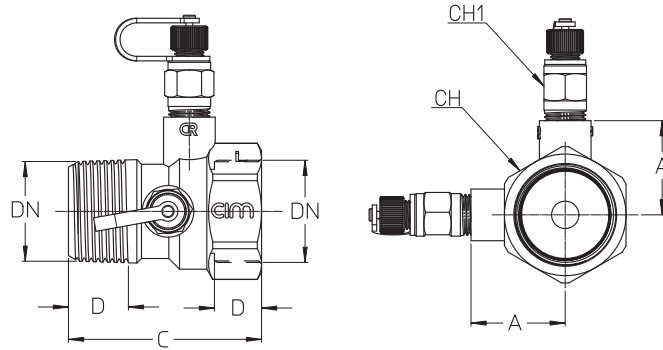


Kvs (Flow rate in m <sup>3</sup> /h @ 1 bar pressure drop)											
DN	15UUL	15ULL	15UL	15L	15M	15	20	25	32	40	50
Kvs	0.10	0.17	0.23	0.47	0.98	1.80	4.06	7.45	16.63	23.00	47.35

TECHNICAL DATA SHEET

Main dimensions:

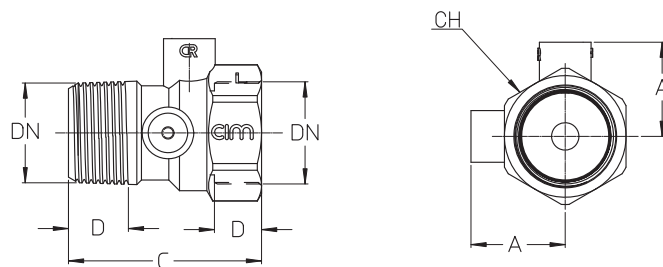
Cim 721



DN	15UUL	15ULL	15UL	15L	15M	15	20	25	32	40	50
Grms.	225	225	225	225	225	225	270	315	465	525	810
A	25	25	25	25	25	25	28	31	36	39	45
C	67	67	67	67	67	67	67	64	71	71	80
D	15	15	15	15	15	15	16.3	19.1	21.4	21.4	25.7
CH	28	28	28	28	28	28	34	40	51	56	71
CH1	14	14	14	14	14	14	14	14	14	14	14

Main dimensions:

Cim 722



DN	15UUL	15ULL	15UL	15L	15M	15	20	25	32	40	50
Grms.	165	165	165	165	165	165	210	255	400	460	745
A	25	25	25	25	25	25	28	31	36	39	45
C	67	67	67	67	67	67	67	64	71	71	80
D	15	15	15	15	15	15	16.3	19.1	21.4	21.4	25.7
CH	28	28	28	28	28	28	34	40	51	56	71



## TECHNICAL DATA SHEET

### **Maintenance:**

As a rule, the flow measurement device Cim 721 does not need any maintenance. In case of replacement or need of disassembling of some components of the valve, make sure that the installation is not underservice or pressure.

cav. uff.   
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IMR 562637



FM 01820



SA 551551



EMS 551553



OHS 551552



ENMS 577357