HANDBOOK

PIPING ACCESSORIES

Castel®
Italian technology

Ed. 2017

CHAPTER 3
ACCESS FITTINGS AND VALVE CORES
FOR REFRIGERATION PLANTS THAT USE HCFC, HFC, HC, HFO, OR R744 REFRIGERANTS

APPLICATIONS
The access fittings illustrated in this chapter are designed for installation on commercial refrigeration systems and on civil and industrial air conditioning plants that use the following refrigerant fluids:
- HCFC (R22)
- HFC (R134a, R404A, R407C, R410A, or R507)
- HFO and HFO/HFC mixtures (R1234ze, R448A, R449A, R450A, and R452A)
- R744 subcritical and transcritical, limited to components with PS = 120 bar

belonging to Group 2, as defined in Article 13, Chapter 1, Point (b) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
The access fittings illustrated in this chapter can be installed also on systems that use the following refrigerant fluids:
- HFC (R32)
- HFO (R1234yf)
- HC (R290, R600, or R600a)

belonging to Group 1, as defined in Article 13, Chapter 1, Point (a) of Directive 2014/68/EU, with reference to EC Regulation No. 1272/2008.
To use the valve cores with the various refrigerant fluids listed above, please refer to Table 14 in this chapter.
For specific applications with refrigerant fluids not listed above, please contact Castel Technical Department.

OPERATION
The access fittings allow creating a loading or draining point rapidly and with a minimum expense. After completion of the filling or draining operations, use of the cap and gasket (p/n 8392/A or 8391/A) prevents any refrigerant leakage.
For special customer requirements, the cap 8392/A can be replaced by a blind union p/n 7020/20. The latter solution requires that the union be tightened using a torque wrench to 8.5 ÷ 11.5 Nm. **Note: it is not necessary to use a copper gasket between union 7020/20 and the filling connector chosen.**
For systems using refrigerant fluid R410A, Castel has developed three specific filling connectors with 5/16" SAE-Flare connection (p/n 8350/X09, 8351/X05 and 8351/X07) that must be used with the following parts:
- Valve core, p/n 8395/A1 or 8395/A3
- Blind union, p/n 7020/X02

This solution for R410A requires to the union to be tightened with a torque wrench to 8.5 ÷ 11.5 Nm. **Note: also in this case, it is not necessary to use a copper gasket between union 7020/X02 and the filling connector chosen.**
If a component other than the two blind unions in series 7020 must be tightened on the access fittings (for example a pressure gauge), a tapered gasket with tang (p/n 8580/2) must be positioned between the component and the chosen access fitting.

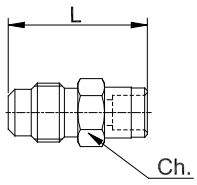
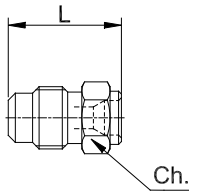
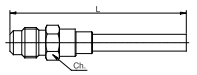
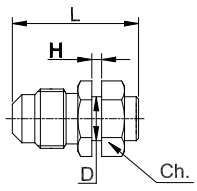
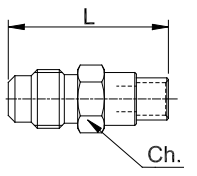
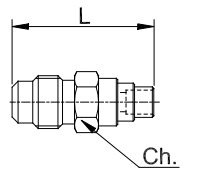
The access fittings have different shapes and sizes, according to varying customer requirements. For all access fittings, the valve core seat is manufactured according to the ARI STANDARD 720:1997.
After tightening the valve core inside the access fitting with the dedicated wrench, p/n 8390/A, to the indicated torque, the refrigerant passage, filling or draining is obtained simply by activating the needle on the valve core.

CONSTRUCTION
The straight fittings are machined by hexagonal brass bar EN 12164 – CW 614N.

The T and cross fittings are hot forged in brass EN 12420 – CW 617N.
Cap 8391/A is moulded Nylon.
Caps 8392/A and 8392/B are machined from hexagonal brass bar EN 12164 – CW 614N, with chloroprene rubber (CR) gasket.
Valve core 8394/B is equipped with chloroprene rubber (CR) and PTFE gaskets

Valve core 8395/A1 is equipped with chloroprene rubber (CR) gaskets
Valve core 8395/A3 is equipped with hydrogenated nitrile rubber (HNBR) gaskets
Valve core 8395/A4 is equipped with ethylene propylene rubber (EPDM) gaskets
The tapered gasket with tang, 8580/2, is manufactured from copper Cu - ETP UNI 5649.

TABLE 10: General characteristics of access fittings

	Part number	Connections								PS [bar]	Dimensions [mm]				Weight [g]
		SAE Flare			NPT	ODS		IDS			L	Ch	D	H	
		Valve core	m	f		Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]						
Straight access fittings															
	8350/22	1/4"	–	–	–	1/4"	–	3/8"	–	120	26	11	–	–	12
	8350/X10	1/4"	–	–	–	1/4"	–	–	10		26	11	–	–	12
	8350/X01	1/4"	–	–	–	–	6	–	–	120	20	11	–	–	10
	8350/X03	1/4"	–	–	–	–	–	–	6	45	90	11	–	–	23
	8350/X06	1/4"	–	–	–	–	–	1/4"	–		126	11	–	–	28
	8350/X07	1/4"	–	–	–	–	–	1/4"	–		326	11	–	–	58
	8350/X12	1/4"	–	–	–	–	–	–	6		180	11	–	–	
	8350/X09	5/16"	–	–	–	1/4"	–	–	–	45	27	14	9,4	2,1	19
	8351/2	1/4"	–	–	–	–	6	–	8 - 10	120	30	11	–	–	13
	8351/X04	1/4"	–	–	–	–	–		6		26	11	–	–	11
	8351/X05	5/16"	–	–	–	–	–	3/8"	7		27	14	–	–	18
	8351/X07	5/16"	–	–	–	–	–	3/8"	6		27	14	–	–	19
	8351/X01	1/4"	–	–	–	–	1/8"	–	6	120	36	11	–	–	13
	8351/X02	1/4"	–	–	–	–	5	1/4" 5/16" 3/8"	–		26	11	–	–	11
	8351/X06	1/4"	–	–	–	–	–	–	6 8 10		28	11	–	–	13

Continued

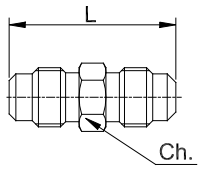
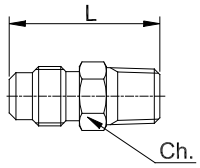
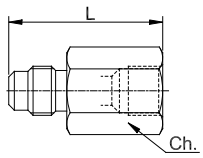
TABLE 10: General characteristics of access fittings															
	Part number	Connections								PS [bar]	Dimensions [mm]				Weight [g]
		SAE Flare			NPT	ODS		IDS			L	Ch	D	H	
		Valve core	m	f		Ø [in.]	Ø [mm]	Ø [in.]	Ø [mm]						
Straight access fittings															
	8352/22	1/4"	1/4"	–	–	–	–	–	–	120	31	11	–	–	15
	8354/21	1/4"	–	–	1/8"	–	–	–	–	120	28	11	–	–	13
	8354/22	1/4"	–	–	1/4"	–	–	–	–		33	14	–	–	25
	8354/23	1/4"	–	–	3/8"	–	–	–	–		38	17	–	–	41
	8362/22	1/4"	–	1/4"	–	–	–	–	–	120	35	17	–	–	42

TABLE 11: General characteristics of access fittings

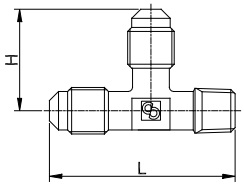
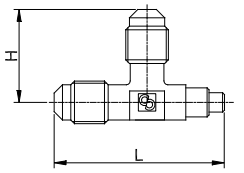
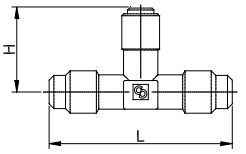
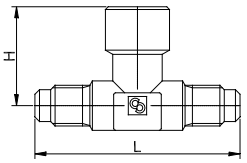
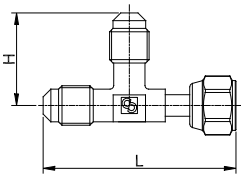
	Part number	Connections					PS [bar]	Dimensions [mm]			Wrench torque min / max [Nm]	Weight [g]	Note
		SAE Flare		NPT	IDS			L	Ch	H			
		m	f		Ø [in.]	Ø [mm]							
TEE access fittings													
	8380/122	1/4"	–	1/8"	–	–	120	45	–	24	–	31	The valve core may be installed on each of the two 1/4" SAE Flare male connections
	8380/222	1/4"	–	1/4"	–	–		49,5	–	25,5	–	44	
	8380/X01	1/4"	–	–	–	6	120	43	–	24	–	28	
	8380/X02	1/4"	–	–	–	7	120	48	–	22	–	33	
	8380/X09	1/4"	1/4"	–	–	–	120	56	–	27	–	70	
TEE access fittings with swivel nuts													
	8380/X06	1/4"	1/4"	–	–	–	45	50	–	24	11/14	47	With valve-core opening device on female connection. The valve core may be installed on each of the two 1/4" SAE Flare connections
	8380/X08	1/4"	1/4"	–	–	–	45	49	17	24	11/14	49	The valve core may be installed on each of the two 1/4" SAE Flare male connections

TABLE 12: General characteristics of access fittings

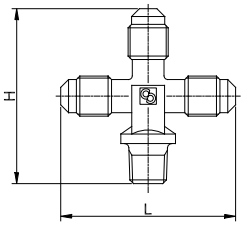
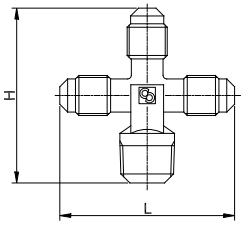
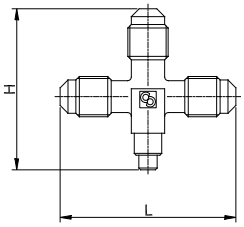
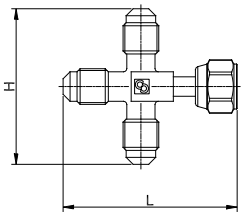
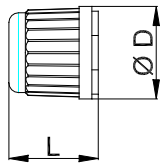
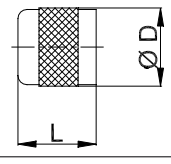
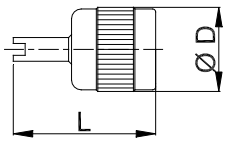
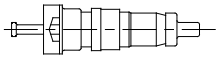
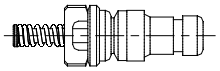
	Part number	Connections					PS [bar]	Dimensions [mm]			Wrench torque min / max [Nm]	Weight [g]	Note
		SAE Flare		NPT	IDS			L	Ch	H			
		m	f		Ø [in.]	Ø [mm]							
Cross access fittings													
	8382/1222	1/4"	–	1/8"	–	–	120	48	–	50	–	49	
	8382/X02	1/4"	–	1/4"	–	–	120	48	–	50	–	53	The valve core may be installed on each of the three 1/4" SAE Flare male connections
	8382/X01	1/4"	–	–	–	7-10	120	48	–	47	–	47	
	8382/X03	1/4"	–	–	–	6		48	–	44	–	42	
Cross access fittings with swivel nut													
	8382/X04	1/4"	1/4"	–	–	–	45	50	17	46	11/14	35	With valve-core opening device on female connection. The valve core may be installed on each of the three 1/4" SAE Flare connections

TABLE 13: General characteristics of caps with gasket

	Part number	Connections		PS [bar]	TS [°C]		Dimensions [mm]		Weight [g]
		SAE Flare			min	max	L	D	
	8391/A	-	1/4"	35	-20	+100	14	14	1
	8392/A	-	1/4"	80	-20	+100	13	13	7
	8392/B (1)	-	1/4"	80	-20	+100	22	13	7

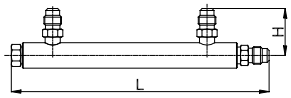
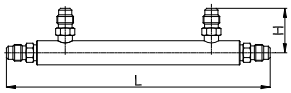
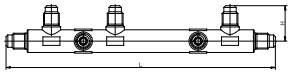
(1) The key needs to remove the valve core

TABLE 14: General characteristics of valve cores

	Part number	Spring	Gaskets		Refrig-erant Fluids	Max Static Pres-sure [bar]	Operat-ing Pressure [bar]	Operating Temperature [°C]		Peak Tem-pera-ture (1) [°C]	Dimensions [mm]		Wrench torque min / max (2) [Nm]	Weight [g]
			body	seat				min	max		L	D		
	8394/B	inside	PTFE	CR	R22 HFC (3)	40	28	-32	+100	125	19,5	5,2 x 0,705 V0.07.1	0,30/0,35 Nm	1
	8395/A1	outside	CR	CR	R22 HFC (3) HFO (4)	140	60	-32	+100	125	16,3		0,4/0,5 Nm	0,7
	8395/A3		HNBR	HNBR	HFC (3) HFO (4) HC (5)	140	60	-25	+130	150				
	8395/A4		EPDM	EPDM	R744	140	80	-35	+120	140				

Note:
(1) Permitted value for short periods
(2) To remove the valve core use the key code 8390/A
(3) R134a, R32, R404A, R407C, R410A, R507
(4) R1234yf, R1234ze, R448A, R449A, R450A, R452A
(5) R290, R600, R600a

TABLE 15: General characteristics of manifolds with access fittings

	Part number	Connections	PS [bar]	Dimensions [mm]		Weight [g]	Note
		SAE Flare		L	D		
	9900/X87	1/4"	45	162	30	36	N° 3 access fittings
	9900/X47	1/4"	45	175	30	216	N° 4 access fittings
	9900/X81	1/4"	45	190	25	343	N° 7 access fittings

www.castel.it

ed. 001-AT-ENG

Castel Srl - Via Provinciale 2-4 - 20060 Pessano con Bornago - MI