HENCO PRESS

2.1 HENCO PRESS - STANDARD

Technical details

* High-quality synthetic material

PVDF

The synthetic press fittings are made from injection moulded PVDF (Polyvinylidene fluoride)*. PVDF offers the user a unique combination of properties:

- excellent mechanical strength and hardness
- high wear-resistance
  enormous flexibility: can be bent to 10°
- exceptional resistance to thermal aging
- extremely resistant to extreme temperatures:
  from -40°C to +150°C
- high purity
- no water absorption
- excellent chemical resistance against the most aggressive substances and solvents
- physiologically harmless, approved for contact with food products, drinking water and for use in the medical sector

PVDF is a synthetic material that is used for numerous applications in our society and has already proved its qualities for more than 30 years in a variety of fields.

PVDF should be used in:

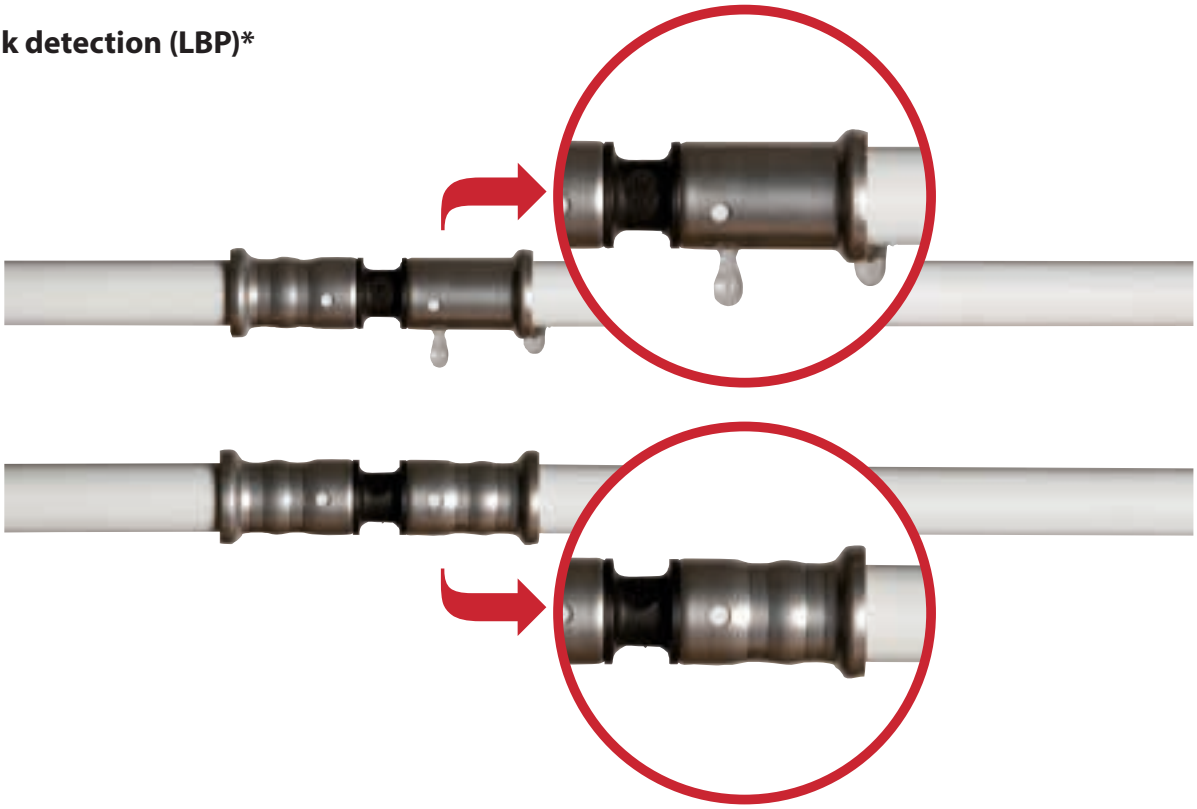
- drinking water installations
- heating installations (radiator connecting pipes/ underfloor heating)
- domestic gas installations
- chemical industry (because of its good resistance to chemicals and its thermo-mechanical properties)
- cable manufacturing industries (because of its fire resistance and low smoke emission)
- food industry (because of it purity and surface qualities

PVDF has extremely favourable properties, especially when compared to metal systems. For instance, PVDF is resistant to corrosion. The extremely smooth wall of the fitting makes it very resistant to any form of attack. Furthermore, PVDF also produces less noise and there is no possibility of water contamination. Finally PVDF is not only lighter but also considerably cheaper than metal fittings.

Brass

The synthetic transition fittings made by Henco (female thread, male thread) are made from PVDF and have inserts made from brass CW617N or CW602N (DZR: dezincification resistant brass).

Leak detection (LBP)*



Henco synthetic press fittings are designed in such a way that they leak immediately if you forget to press the fitting during assembly.

Pressing the fitting has a two functions:

- It seals the O-ring
- It fastens the fitting to the pipe

If the fitting is not pressed it will leak when the system pressure is 0.5 Bar. This allows early detection of errors (during the required pressing of the piping system) and avoids damage caused by leaks.

Not pressed in the correct position

If the jaws of the pressing tool are incorrectly positioned on the fitting, the sleeve will not press sufficiently against the O-ring. In that case too, the fitting will leak when it is pressurised.

Poor functioning of pressing tool

If the pressingtool does not function well (insufficiently pressed), the fitting will also leak when pressed. So in addition to leak detection there is also press detection!

PRESSCHECK1432

* *Up to diameter 26.*

Instructions for the PRESSCHECK measurement tool

1. Check the Ø of the press connection.

2. Find the corresponding Ø on the measurement tool.

3. Place the corresponding cut-away section of the measurement tool on the indented section on the press sleeve.

4. Note that the measurement tool and the indented section fit together perfectly.

5. Rotate the tool 360° around the indented section and ensure that they mate perfectly together during this action as in step 4. Should this fail (for instance the distance is too great or there is an obstruction), then there is something wrong with the pressing in the connection. In this case we recommend that you make a completely new press connection and check the press machine using the jaws of the press tool.

NOTE! The PRESSCHECK measurement tool is only suitable for use on press connections made with the Henco profile (BE profile) or the TH profile (up to Ø 26) combined with a Henco PVDF or brass press connection.

NOTE! After pressing, the fitting may no longer be rotated in relation to the pipe.

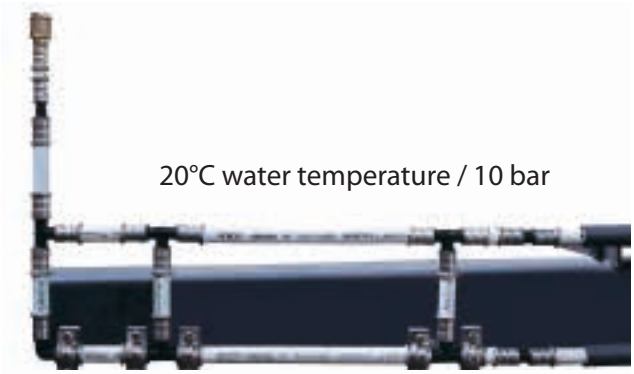
The strength and flexibility of the HENCO synthetic fitting

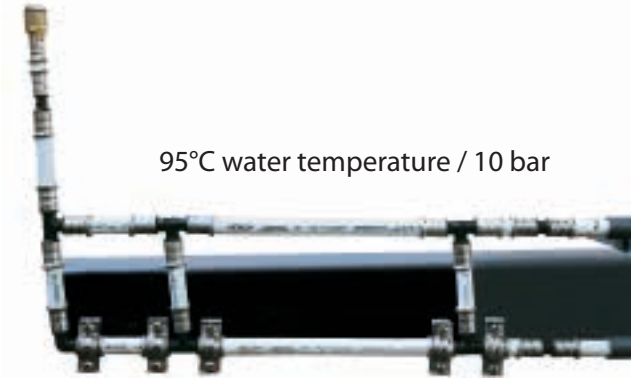
This test was carried out in the Henco laboratory. The brackets were intentionally attached to the pressure sleeves of the bottom fittings for rigidity.

The first photograph shows us how the pipes and the fittings behave when water at a temperature of 20°C is flowing through under a pressure of 10 bar.
Nothing happens to the original test setup.

The second photograph shows how the test setup responds when water at 95°C and under a pressure of 10 bar is pumped through the piping system. The setup leans in the direction of the flow. The T-pieces and also the bend fittings accommodate the expansion forces.
The test shows the strength and flexibility of the Henco PVDF synthetic fitting.

Henco guarantees that fittings will bend by no more than 10° at a water temperature of 95°C.





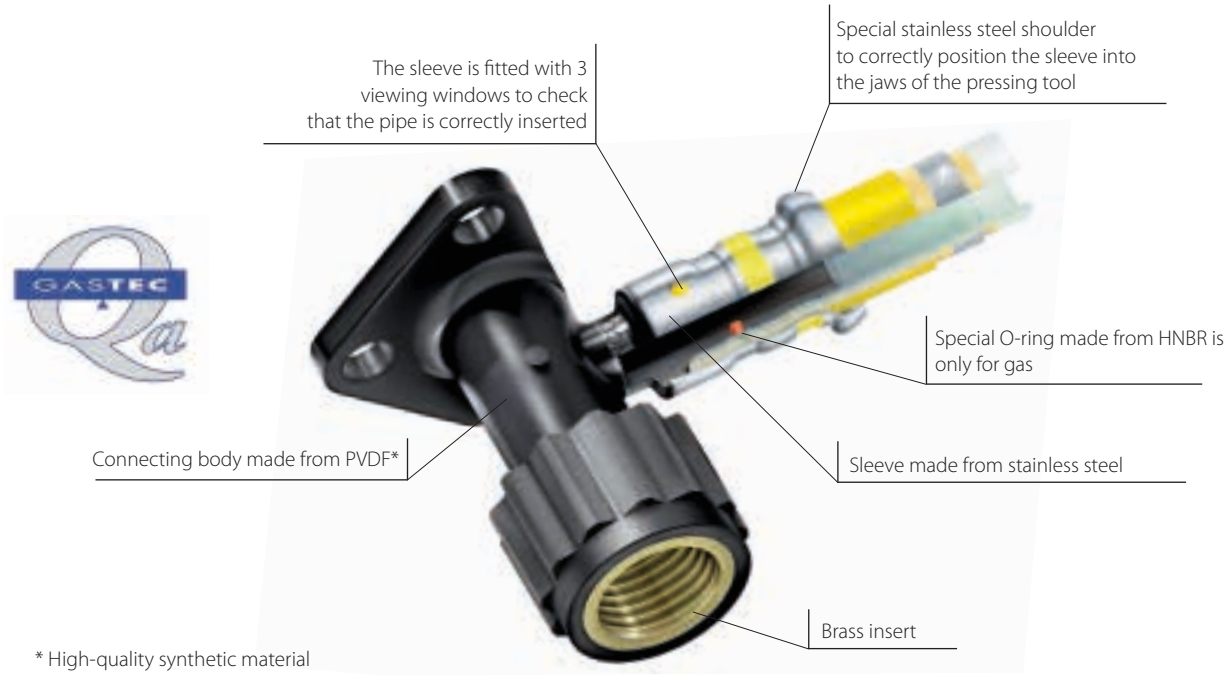
Technical characteristics

The table below shows the most important technical characteristics for PVDF.

Density	g/cm3	1.78
Yield point	MPa	54
Tensile strength	MPa	46
Elongation at fracture	%	80
Modulus of elasticity	MPa	2400
Bending strength	MPa	74
Bending modulus	MPa	2300
Melting point	°C	174
Thermal conduction at 23°C	W/m.K	0.19
Thermal stability	°C	380

2.2 HENCO PRESS - GAS

The PVDF press fittings for gas differ in only one significant technical aspect compared to press fittings for sanitary and heating applications.
The fittings have a special O-ring that is made from the HNBR and is resistant to gas. To make this difference visible, every pressure sleeve has a yellow band. The fittings for gas should never be used for sanitary applications or heating applications.
Similarly, fittings for gas should only be used in combination with the yellow Henco multilayer pipe for gas.



KIWA Gas quality mark

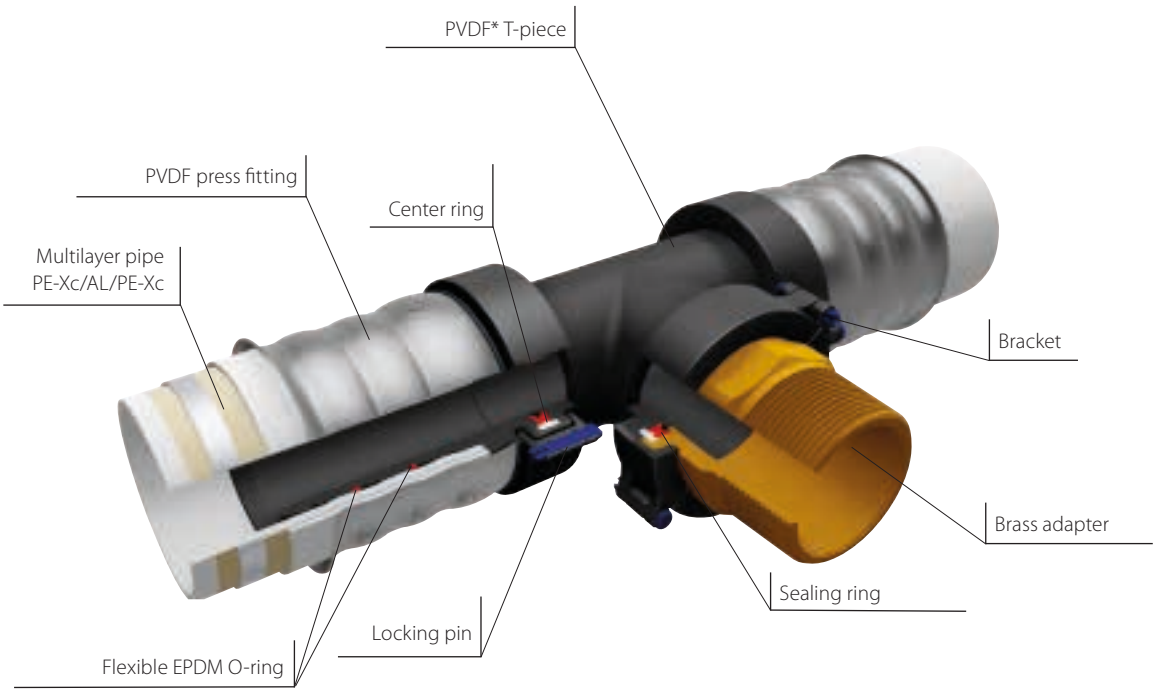
The Henco system for gas is only permitted in countries where a gas quality mark has been granted. Consult the regulations gas piping systems which apply in the country. The Henco synthetic gas system carries the KIWA-GASTEC gas quality mark 39581/01 and is intended for domestic gas installations and for transporting gas according to NPR-3378-5 and NPR-3378-6 of December 2012 and the amendments 3378-5/A1 and 3378-6/A1.

See page 28 for the installation options available for gas piping and gas fittings.

2.3 HENCO SUPER SIZES

General

The Henco Super Size range refers to the Henco multilayer pipe and the Henco fittings in diameters 75 - 90 - 110 mm, with reducing couplings for diameters 32 - 40 - 50 - 63 mm. The fittings assure a complete multilayer piping system with multiple variations for distribution and riser systems. The numerous combinations and the revolutionary connection technique make this system extremely flexible.



* Polyvinylidene Fluoride

The Henco Super Size fittings are made of the Polyvinylidene Fluoride (PVDF), a high quality synthetic material. The PVDF offers the user a unique combination of properties

- corrosion resistant
- excellent mechanical strength and hardness
- resistant to extreme temperatures: from -40°C to +150°C
- approved for contact with water and food
- a maximum working pressure up till 10 bar and a maximum working temperature up till 95°C

All these favourable properties make this multilayer system suitable for numerous applications such as drinking water installations, heating installations and installations in the chemical and food industry.

The Henco Super Size fittings are just like all other Henco fittings designed with a leak before press detection. More information about this subject can be found on page 42.

2 HENCO PRESS

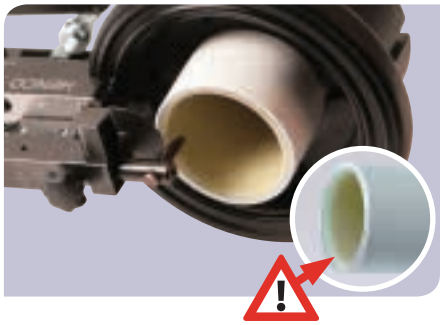
Easy use – making a press connection

The Henco toolset for Super Sizes allows a press connection in three simple steps. A specially designed table with pipe cutter, press jaw and hydraulic pump ensures a carefree press connection.

1 CUT

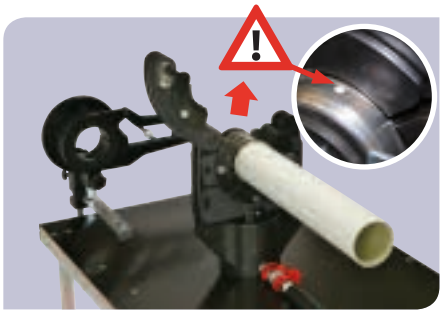
Cut the pipe squarely at 90° with the pipe cutter. The pipe cutter is provided with a clamp to hold the pipe in its proper position.

2 BEVEL



Bevel the inside of the pipe by positioning the bevel tool against the inner layer of the pipe and turn the tool 360° round.

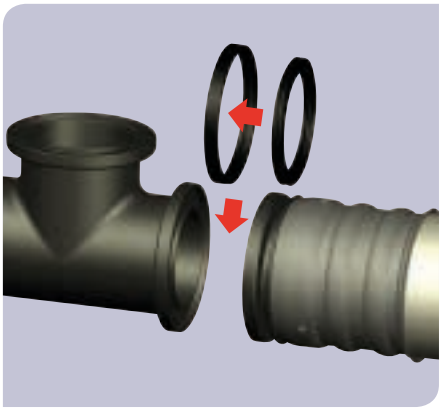
3 PRESS

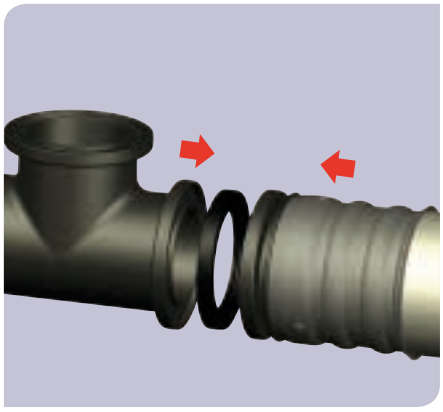


Position the fitting in the press jaw and ensure that the shoulder of the fitting is located in the aluminum positioning component. Afterwards insert the pipe all the way into the press fitting until the colour of the pipe is visible through the inspection windows. Now the fitting can be pressed by activating the hydraulic pump.

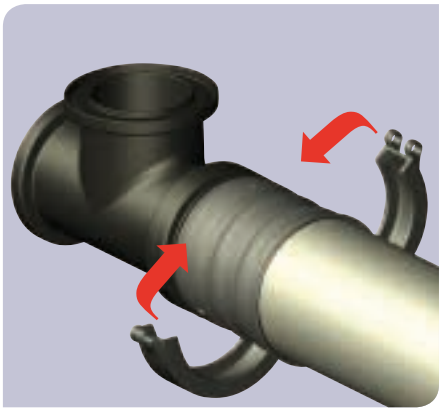
Easy use - assembly

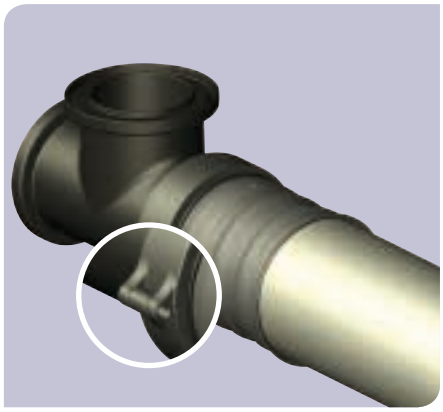
Thanks to a revolutionary connection technique, the Henco multilayer pipe can easily be connected with the Henco Super Size fittings. The pressed pipe can be connected to the fitting using the bracket set consisting of a bracket, a center ring and a sealing ring. The assembly can easily be made in small and narrow locations as the pressing takes place on the working table.



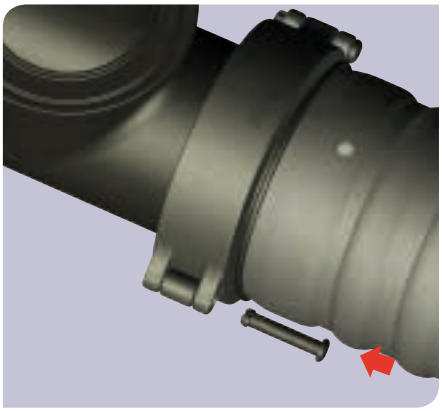


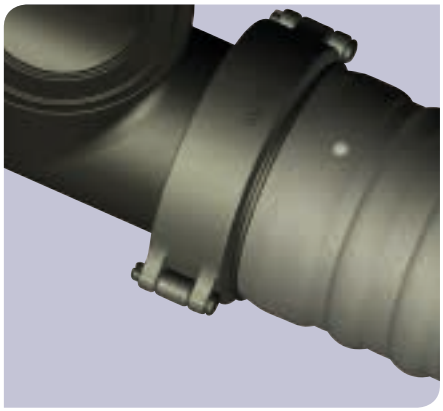
Position the sealing ring in the center ring before connecting the pressed pipe and the fitting.





Match both pieces into each other and place the bracket around the shoulders of both fittings.



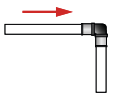
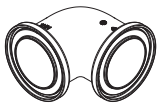
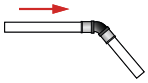
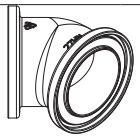
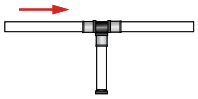
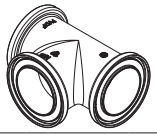
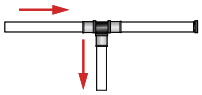
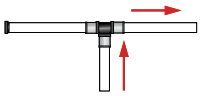


Make the connection complete by closing the bracket with the locking pin.

Overview of flow loss coefficients (Zeta values)

Liquids do not only lose energy when they flow through a pipe. They also lose energy when they change direction. This is because liquids have to overcome extra resistance.

The table below provides an overview of the flow loss coefficients for the various fittings and the corresponding number of meters of piping.

Zeta values (Medium: water at 20°C)				
		Ø75	Ø90	
Straight coupling 	zeta	0,409	1,533	
90° bend 	zeta	1,796	1,749	
45° bend 	zeta	-	0,695	
T-piece 	zeta	0,409	0,108	
	zeta	1,869	1,895	
	zeta	1,869	1,820	
		Ø90-75		
Reduction 	zeta	0,904		

2.4 HENCO ECOLINE

The HENCO ECO-line is an energy saving solution for recirculation loops, which limits heat loss between supply and return pipe.

Advantages

Only half the quantities needed

- Fittings
- Brackets
- Fire stop barriers
- Insulation
- Core drill holes
- Assembly

Energy saving

- Limited heat loss
- Always the required temperature at the draw-off point
- Legionella contamination can be prevented with temperature control

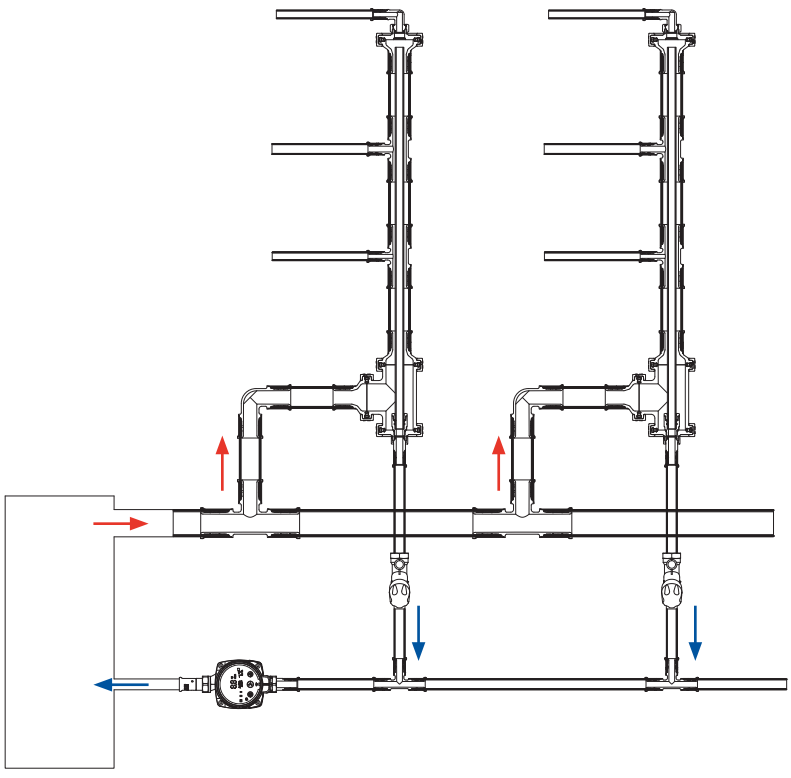
Less space consumption

- A separate pipe for the circulation water is no longer required.

Designed on the Henco Super Size concept, one concept for all dimensions from 40 up to 75 mm!
All assembly instructions for processing products of Henco are applicable.

Specifics

The return pipe flow is governed by means of a thermostatic circulation valve.
A circulation pump ensures the return flow to the heat source.



Complementary products

Henco 1L PEXc

8HNA
Ø 40-50-63-75

19PK
Ø 16-20

19SK
Ø 16-20

19P
Ø 16-20

33P
Ø 16

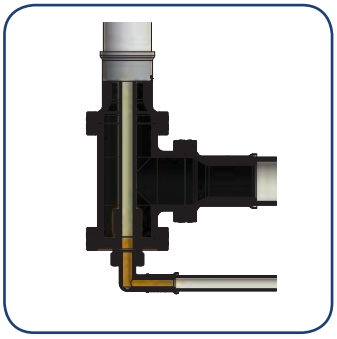
To complete the Ecoline installation you need (not in Henco range)

- Circulator
- Thermostatic balancing valve

Details

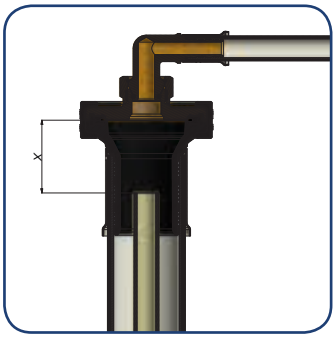
Composition of the HNA-ECOLINE SET

- 1x 9HNA (T-piece)
- 4x HNA (bracket set)
- 1x HNA-EK05 (adapter HNA-EK)
- 1x HNA-INLB (base plate for ECO-LINE)



Montage

The base plate is fitted with a brass push fit fitting for a 16 mm PEXc pipe.
The PEXc pipe is shortened at the top for expansion purposes (X marking).



Expansion

$$\Delta L = L \times \alpha \times \Delta T \ (+30 \text{ mm})$$

ΔL	=	change in length
L	=	length of pipe
α	=	coefficient of expansion
ΔT	=	temperature difference

and where the coefficient of expansion is 0.190 mm/mK irrespective of the diameter of the pipe.

Example:

Given that: L = **16 m**
α = 0,19 mm/mK
ΔT = **50°C** (montage at 15°C, supply 65°C)

Required: ΔL = change in length

Formula: $\Delta L = L \times \alpha \times \Delta T$
ΔL = 16 x 0,19 x 50 = 152 mm (+ 30 mm)

In the calculation example the inner return pipe is made 182 mm (18,2 cm) shorter than the supply pipe.

2 HENCO PRESS

		40 x 3,5				50 x 4				63 x 4,5				75 x 6	
Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed
l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)
1806	30,10	2,086	0,765	6020	100,33	4,481	1,416	12298	204,97	4,065	1,622	19952	332,53	4,507	1,904
1849	30,82	2,177	0,784	6063	101,05	4,541	1,426	12341	205,68	4,092	1,628	19995	333,25	4,525	1,908
1892	31,53	2,269	0,802	6106	101,77	4,600	1,436	12384	206,40	4,118	1,634	20038	333,97	4,543	1,913
1935	32,25	2,364	0,820	6149	102,48	4,660	1,446	12427	207,12	4,145	1,639	20081	334,68	4,561	1,917
1978	32,97	2,460	0,838	6192	103,20	4,721	1,456	12470	207,83	4,171	1,645	20124	335,40	4,579	1,921
2021	33,68	2,558	0,857	6235	103,92	4,781	1,466	12513	208,55	4,198	1,651	20167	336,12	4,598	1,925
2064	34,40	2,658	0,875	6278	104,63	4,843	1,476	12556	209,27	4,225	1,657	20210	336,83	4,616	1,929
2107	35,12	2,760	0,893	6321	105,35	4,904	1,486	12599	209,98	4,252	1,662	20253	337,55	4,634	1,933
2150	35,83	2,863	0,911	6364	106,07	4,966	1,496	12642	210,70	4,279	1,668	20296	338,27	4,653	1,937
2193	36,55	2,968	0,929	6407	106,78	5,028	1,507	12685	211,42	4,306	1,674	20339	338,98	4,671	1,941
2236	37,27	3,075	0,948	6450	107,50	5,091	1,517	12728	212,13	4,333	1,679	20382	339,70	4,690	1,945
2279	37,98	3,184	0,966	6493	108,22	5,154	1,527	12771	212,85	4,360	1,685	20425	340,42	4,708	1,950
2322	38,70	3,294	0,984	6536	108,93	5,217	1,537	12814	213,57	4,388	1,691	20468	341,13	4,727	1,954
2365	39,42	3,407	1,002	6579	109,65	5,281	1,547	12857	214,28	4,415	1,696	20511	341,85	4,745	1,958
2408	40,13	3,521	1,021	6622	110,37	5,345	1,557	12900	215,00	4,443	1,702	20554	342,57	4,764	1,962
2451	40,85	3,636	1,039	6665	111,08	5,409	1,567	12943	215,72	4,470	1,708	20597	343,28	4,782	1,966
2494	41,57	3,754	1,057	6708	111,80	5,474	1,577	12986	216,43	4,498	1,713	20640	344,00	4,801	1,970
2537	42,28	3,873	1,075	6751	112,52	5,539	1,587	13029	217,15	4,526	1,719	20683	344,72	4,820	1,974
2580	43,00	3,994	1,094	6794	113,23	5,605	1,598	13072	217,87	4,553	1,725	20726	345,43	4,839	1,978
2623	43,72	4,117	1,112	6837	113,95	5,671	1,608	13115	218,58	4,581	1,730	20769	346,15	4,857	1,982
2666	44,43	4,241	1,130	6880	114,67	5,737	1,618	13158	219,30	4,609	1,736	20812	346,87	4,876	1,986
2709	45,15	4,367	1,148	6923	115,38	5,804	1,628	13201	220,02	4,637	1,742	20855	347,58	4,895	1,991
2752	45,87	4,495	1,166	6966	116,10	5,871	1,638	13244	220,73	4,665	1,747	20898	348,30	4,914	1,995
2795	46,58	4,625	1,185	7009	116,82	5,938	1,648	13287	221,45	4,694	1,753	20941	349,02	4,933	1,999
2838	47,30	4,756	1,203	7052	117,53	6,006	1,658	13330	222,17	4,722	1,759	20984	349,73	4,952	2,003
2881	48,02	4,889	1,221	7095	118,25	6,074	1,668	13373	222,88	4,750	1,764	21027	350,45	4,971	2,007
2924	48,73	5,024	1,239	7138	118,97	6,142	1,678	13416	223,60	4,779	1,770	21070	351,17	4,990	2,011
2967	49,45	5,160	1,258	7181	119,68	6,211	1,689	13459	224,32	4,807	1,776	21113	351,88	5,009	2,015
3010	50,17	5,299	1,276	7224	120,40	6,280	1,699	13502	225,03	4,836	1,781	21156	352,60	5,028	2,019
3053	50,88	5,439	1,294	7267	121,12	6,350	1,709	13545	225,75	4,865	1,787	21199	353,32	5,047	2,023
3096	51,60	5,580	1,312	7310	121,83	6,420	1,719	13588	226,47	4,893	1,793	21242	354,03	5,066	2,028
3139	52,32	5,724	1,330	7353	122,55	6,490	1,729	13631	227,18	4,922	1,798	21285	354,75	5,085	2,032
3182	53,03	5,869	1,349	7396	123,27	6,561	1,739	13674	227,90	4,951	1,804	21328	355,47	5,104	2,036
3225	53,75	6,016	1,367	7439	123,98	6,632	1,749	13717	228,62	4,980	1,810	21371	356,18	5,124	2,040
3268	54,47	6,164	1,385	7482	124,70	6,703	1,759	13760	229,33	5,009	1,815	21414	356,90	5,143	2,044
3311	55,18	6,315	1,403	7525	125,42	6,775	1,769	13803	230,05	5,038	1,821	21457	357,62	5,162	2,048
3354	55,90	6,467	1,422	7568	126,13	6,847	1,780	13846	230,77	5,068	1,827	21500	358,33	5,182	2,052
3397	56,62	6,620	1,440	7611	126,85	6,919	1,790	13889	231,48	5,097	1,832	21543	359,05	5,201	2,056
3440	57,33	6,776	1,458	7654	127,57	6,992	1,800	13932	232,20	5,126	1,838	21586	359,77	5,220	2,060
3483	58,05	6,933	1,476	7697	128,28	7,065	1,810	13975	232,92	5,156	1,844	21629	360,48	5,240	2,064
3526	58,77	7,091	1,494	7740	129,00	7,139	1,820	14018	233,63	5,186	1,849	21672	361,20	5,259	2,069
3569	59,48	7,252	1,513	7783	129,72	7,213	1,830	14061	234,35	5,215	1,855	21715	361,92	5,279	2,073
3612	60,20	7,414	1,531	7826	130,43	7,287	1,840	14104	235,07	5,245	1,861	21758	362,63	5,298	2,077
3655	60,92	7,578	1,549	7869	131,15	7,362	1,850	14147	235,78	5,275	1,866	21801	363,35	5,318	2,081
3698	61,63	7,744	1,567	7912	131,87	7,437	1,860	14190	236,50	5,305	1,872	21844	364,07	5,338	2,085
3741	62,35	7,911	1,586	7955	132,58	7,512	1,871	14233	237,22	5,335	1,878	21887	364,78	5,357	2,089
3784	63,07	8,080	1,604	7998	133,30	7,588	1,881	14276	237,93	5,365	1,883	21930	365,50	5,377	2,093
3827	63,78	8,251	1,622	8041	134,02	7,664	1,891	14319	238,65	5,395	1,889	21973	366,22	5,397	2,097
3870	64,50	8,423	1,640	8084	134,73	7,740	1,901	14362	239,37	5,425	1,895	22016	366,93	5,416	2,101
3913	65,22	8,597	1,659	8127	135,45	7,817	1,911	14405	240,08	5,455	1,900	22059	367,65	5,436	2,105
3956	65,93	8,773	1,677	8170	136,17	7,894	1,921	14448	240,80	5,486	1,906	22102	368,37	5,456	2,110
3999	66,65	8,950	1,695	8213	136,88	7,972	1,931	14491	241,52	5,516	1,912	22145	369,08	5,476	2,114
4042	67,37	9,129	1,713	8256	137,60	8,050	1,941	14534	242,23	5,547	1,917	22188	369,80	5,496	2,118
4085	68,08	9,310	1,731	8299	138,32	8,128	1,951	14577	242,95	5,578	1,923	22231	370,52	5,516	2,122
4128	68,80	9,493	1,750	8342	139,03	8,207	1,962	14620	243,67	5,608	1,929	22274	371,23	5,536	2,126
4171	69,52	9,677	1,768	8385	139,75	8,286	1,972	14663	244,38	5,639	1,934	22317	371,95	5,556	2,130
4214	70,23	9,863	1,786	8428	140,47	8,365	1,982	14706	245,10	5,670	1,940	22360	372,67	5,576	2,134
4257	70,95	10,050	1,804	8471	141,18	8,445	1,992	14749	245,82	5,701	1,946	22403	373,38	5,596	2,138
4300	71,67	10,239	1,823	8514	141,90	8,525	2,002	14792	246,53	5,732	1,952	22446	374,10	5,616	2,142
4343	72,38	10,430	1,841	8557	142,62	8,605	2,012	14835	247,25	5,763	1,957	22489	374,82	5,636	2,147
4386	73,10	10,623	1,859	8600	143,33	8,686	2,022	14878	247,97	5,794	1,963	22532	375,53	5,656	2,151
4429	73,82	10,817	1,877	8643	144,05	8,767	2,032	14921	248,68	5,826	1,969	22575	376,25	5,677	2,155
4472	74,53	11,013	1,895	8686	144,77	8,849	2,042	14964	249,40	5,857	1,974	22618	376,97	5,697	2,159
4515	75,25	11,211	1,914	8729	145,48	8,931	2,053	15007	250,12	5,888	1,980	22661	377,68	5,717	2,163
4558	75,97	11,410	1,932	8772	146,20	9,013	2,063	15050	250,83	5,920	1,986	22704	378,40	5,737	2,167
4601	76,68	11,611	1,950	8815	146,92	9,095	2,073	15093	251,55	5,951	1,991	22747	379,12	5,758	2,171
4644	77,40	11,814	1,968	8858	147,63	9,178	2,083	15136	252,27	5,983	1,997	22790	379,83	5,778	2,175
4687	78,12	12,018	1,987	8901	148,35	9,262	2,093	15179	252,98	6,015	2,003	22833	380,55	5,799	2,179
4730	78,83	12,224	2,005	8944	149,07	9,345	2,103	15222	253,70	6,047	2,008	22876	381,27	5,819	2,183
4773	79,55	12,432	2,023	8987	149,78	9,429	2,113	15265	254,42	6,079	2,014	22919	381,98	5,840	2,188
4816	80,27	12,641	2,041	9030	150,50	9,514	2,123	15308	255,13	6,111	2,020	22962	382,70	5,860	2,192
4859	80,98	12,852	2,059	9073	151,22	9,599	2,133	15351	255,85	6,143	2,025	23005	383,42	5,881	2,196
4902	81,70	13,065	2,078	9116	151,93	9,684	2,144	15394	256,57	6,175	2,031	23048	384,13	5,901	2,200
4945	82,42	13,279	2,096	9159	152,65	9,769	2,154	15437	257,28	6,207	2,037	23091	384,85	5,922	2,204
4988	83,13	13,495	2,114	9202	153,37	9,855	2,164	15480	258,00	6,240	2,042	23134	385,57	5,943	2,208

Medium: water at 65°C 1 mbar/m = 100 Pa/m Water velocity max. 3 m/s

		40 x 3,5				50 x 4				63 x 4,5				75 x 6	
Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed
l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)
5031	83,85	13,713	2,132	9245	154,08	9,941	2,174	15523	258,72	6,272	2,048	23177	386,28	5,963	2,212
5074	84,57	13,932	2,151	9288	154,80	10,028	2,184	15566	259,43	6,304	2,054	23220	387,00	5,984	2,216
5117	85,28	14,153	2,169	9331	155,52	10,115	2,194	15609	260,15	6,337	2,059	23263	387,72	6,005	2,220
5160	86,00	14,376	2,187	9374	156,23	10,202	2,204	15652	260,87	6,370	2,065	23306	388,43	6,026	2,225
5203	86,72	14,600	2,205	9417	156,95	10,290	2,214	15695	261,58	6,402	2,071	23349	389,15	6,046	2,229
5246	87,43	14,826	2,223	9460	157,67	10,378	2,224	15738	262,30	6,435	2,076	23392	389,87	6,067	2,233
5289	88,15	15,054	2,242	9503	158,38	10,466	2,235	15781	263,02	6,468	2,082	23435	390,58	6,088	2,237
5332	88,87	15,283	2,260	9546	159,10	10,555	2,245	15824	263,73	6,501	2,088	23478	391,30	6,109	2,241
5375	89,58	15,514	2,278	9589	159,82	10,644	2,255	15867	264,45	6,534	2,093	23521	392,02	6,130	2,245
5418	90,30	15,747	2,296	9632	160,53	10,733	2,265	15910	265,17	6,567	2,099	23564	392,73	6,151	2,249
5461	91,02	15,982	2,315	9675	161,25	10,823	2,275	15953	265,88	6,600	2,105	23607	393,45	6,172	2,253
5504	91,73	16,218	2,333	9718	161,97	10,913	2,285	15996	266,60	6,634	2,110	23650	394,17	6,193	2,257
5547	92,45	16,455	2,351	9761	162,68	11,004	2,295	16039	267,32	6,667	2,116	23693	394,88	6,214	2,261
5590	93,17	16,695	2,369	9804	163,40	11,094	2,305	16082	268,03	6,701	2,122	23736	395,60	6,236	2,266
5633	93,88	16,936	2,388	9847	164,12	11,186	2,315	16125	268,75	6,734	2,127	23779	396,32	6,257	2,270
5676	94,60	17,178	2,406	9890	164,83	11,277	2,326	16168	269,47	6,768	2,133	23822	397,03	6,278	2,274
5719	95,32	17,423	2,424	9933	165,55	11,369	2,336	16211	270,18	6,801	2,139	23865	397,75	6,299	2,278
5762	96,03	17,669	2,442	9976	166,27	11,462	2,346	16254	270,90	6,835	2,144	23908	398,47	6,320	2,282
5805	96,75	17,916	2,460	10019	166,98	11,554	2,356	16297	271,62	6,869	2,150	23951	399,18	6,342	2,286
5848	97,47	18,165	2,479	10062	167,70	11,647	2,366	16340	272,33	6,903	2,156	23994	399,90	6,363	2,290
5891	98,18	18,416	2,497	10105	168,42	11,741	2,376	16383	273,05	6,937	2,161	24037	400,62	6,385	2,294
5934	98,90	18,669	2,515	10148	169,13	11,834	2,386	16426	273,77	6,971	2,167	24080	401,33	6,406	2,298
5977	99,62	18,923	2,533	10191	169,85	11,928	2,396	16469	274,48	7,005	2,173	24123	402,05	6,427	2,303
6020	100,33	19,179	2,552	10234	170,57	12,023	2,406	16512	275,20	7,039	2,178	24166	402,77	6,449	2,307
6063	101,05	19,437	2,570	10277	171,28	12,118	2,417	16555	275,92	7,074	2,184	24209	403,48	6,470	2,311
6106	101,77	19,696	2,588	10320	172,00	12,213	2,427	16598	276,63	7,108	2,190	24252	404,20	6,492	2,315
6149	102,48	19,957	2,606	10363	172,72	12,308	2,437	16641	277,35	7,143	2,195	24295	404,92	6,514	2,319
6192	103,20	20,219	2,624	10406	173,43	12,404	2,447	16684	278,07	7,177	2,201	24338	405,63	6,535	2,323
6235	103,92	20,484	2,643	10449	174,15	12,501	2,457	16727	278,78	7,212	2,207	24381	406,35	6,557	2,327
6278	104,63	20,749	2,661	10492	174,87	12,597	2,467	16770	279,50	7,247	2,212	24424	407,07	6,579	2,331
6321	105,35	21,017	2,679	10535	175,58	12,694	2,477	16813	280,22	7,281	2,218	24467	407,78	6,600	2,335
6364	106,07	21,286	2,697	10578	176,30	12,791	2,487	16856	280,93	7,316	2,224	24510	408,50	6,622	2,339
6407	106,78	21,557	2,716	10621	177,02	12,889	2,497	16899	281,65	7,351	2,229	24553	409,22	6,644	2,344
6450	107,50	21,829	2,734	10664	177,73	12,987	2,508	16942	282,37	7,386	2,235	24596	409,93	6,666	2,348
6493	108,22	22,103	2,752	10707	178,45	13,086	2,518	16985	283,08	7,421	2,241	24639	410,65	6,688	2,352
6536	108,93	22,379	2,770	10750	179,17	13,184	2,528	17028	283,80	7,457	2,247	24682	411,37	6,710	2,356
6579	109,65	22,657	2,788	10793	179,88	13,283	2,538	17071	284,52	7,492	2,252	24725	412,08	6,732	2,360
6622	110,37	22,936	2,807	10836	180,60	13,383	2,548	17114	285,23	7,527	2,258	24768	412,80	6,753	2,364
6665	111,08	23,216	2,825	10879	181,32	13,483	2,558	17157	285,95	7,563	2,264	24811	413,52	6,775	2,368
6708	111,80	23,499	2,843	10922	182,03	13,583	2,568	17200	286,67	7,598	2,269	24854	414,23	6,798	2,372
6751	112,52	23,783	2,861	10965	182,75	13,683	2,578	17243	287,38	7,634	2,275	24897	414,95	6,820	2,376
6794	113,23	24,068	2,880	11008	183,47	13,784	2,589	17286	288,10	7,670	2,281	24940	415,67	6,842	2,380
6837	113,95	24,356	2,898	11051	184,18	13,886	2,599	17329	288,82	7,705	2,286	24983	416,38	6,864	2,385
6880	114,67	24,645	2,916	11094	184,90	13,987	2,609	17372	289,53	7,741	2,292	25026	417,10	6,886	2,389
6923	115,38	24,935	2,934	11137	185,62	14,089	2,619	17415	290,25	7,777	2,298	25069	417,82	6,908	2,393
6966	116,10	25,227	2,953	11180	186,33	14,192	2,629	17458	290,97	7,813	2,303	25112	418,53	6,931	2,397
7009	116,82	25,521	2,971	11223	187,05	14,294	2,639	17501	291,68	7,849	2,309	25155	419,25	6,953	2,401
7052	117,53	25,817	2,989	11266	187,77	14,397	2,649	17544	292,40	7,885	2,315	25198	419,97	6,975	2,405
				11309	188,48	14,501	2,659	17587	293,12	7,922	2,320	25241	420,68	6,998	2,409
				11352	189,20	14,604	2,669	17630	293,83	7,958	2,326	25284	421,40	7,020	2,413
				11395	189,92	14,708	2,680	17673	294,55	7,994	2,332	25327	422,12	7,042	2,417
				11438	190,63	14,813	2,690	17716	295,27	8,031	2,337	25370	422,83	7,065	2,422
				11481	191,35	14,918	2,700	17759	295,98	8,068	2,343	25413	423,55	7,087	2,426
				11524	192,07	15,023	2,710	17802	296,70	8,104	2,349	25456	424,27	7,110	2,430
				11567	192,78	15,128	2,720	17845	297,42	8,141	2,354	25499	424,98	7,132	2,434
				11610	193,50	15,234	2,730	17888	298,13	8,178	2,360	25542	425,70	7,155	2,438
				11653	194,22	15,341	2,740	17931	298,85	8,215	2,366	25585	426,42	7,178	2,442
				11696	194,93	15,447	2,750	17974	299,57	8,252	2,371	25628	427,13	7,200	2,446
				11739	195,65	15,554	2,760	18017	300,28	8,289	2,377	25671	427,85	7,223	2,450
				11782	196,37	15,662	2,771	18060	301,00	8,326	2,383	25714	428,57	7,246	2,454
				11825	197,08	15,769	2,781	18103	301,72	8,363	2,388	25757	429,28	7,268	2,458
				11868	197,80	15,877	2,791	18146	302,43	8,400	2,394	25800	430,00	7,291	2,463
				11911	198,52	15,986	2,801	18189	303,15	8,438	2,400	25843	430,72	7,314	2,467
				11954	199,23	16,094	2,811	18232	303,87	8,475	2,405	25886	431,43	7,337	2,471
				11997	199,95	16,203	2,821	18275	304,58	8,513	2,411	25929	432,15	7,360	2,475
				12040	200,67	16,313	2,831	18318	305,30	8,550	2,417	25972	432,87	7,383	2,479
				12083	201,38	16,423	2,841	18361	306,02	8,588	2,422	26015	433,58	7,406	2,483
				12126	202,10	16,533	2,851	18404	306,73	8,626	2,428	26058	434,30	7,429	2,487
				12169	202,82	16,643	2,862	18447	307,45	8,664	2,434	26101	435,02	7,452	2,491
				12212	203,53	16,754	2,872	18490	308,17	8,702	2,439	26144	435,73	7,475	2,495
				12255	204,25	16,866	2,882	18533	308,88	8,740	2,445	26187	436,45	7,498	2,500
				12298	204,97	16,977	2,892	18576	309,60	8,778	2,451	26230	437,17	7,521	2,504
				12341	205,68	17,089	2,902	18619	310,32	8,816	2,456	26273	437,88	7,544	2,508
				12384	206,40	17,201	2,912	18662	311,03	8,854	2,462	26316	438,60	7,568	2,512

Medium: water at 65°C 1 mbar/m = 100 Pa/m Water velocity max. 3 m/s

2 HENCO PRESS

		40 x 3,5				50 x 4				63 x 4,5				75 x 6	
Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed
l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)
				12427	207,12	17,314	2,922	18705	311,75	8,892	2,468	26359	439,32	7,591	2,516
				12470	207,83	17,427	2,932	18748	312,47	8,931	2,473	26402	440,03	7,614	2,520
				12513	208,55	17,540	2,942	18791	313,18	8,969	2,479	26445	440,75	7,637	2,524
				12556	209,27	17,654	2,953	18834	313,90	9,008	2,485	26488	441,47	7,661	2,528
				12599	209,98	17,768	2,963	18877	314,62	9,046	2,490	26531	442,18	7,684	2,532
				12642	210,70	17,883	2,973	18920	315,33	9,085	2,496	26574	442,90	7,708	2,536
				12685	211,42	17,997	2,983	18963	316,05	9,124	2,502	26617	443,62	7,731	2,541
				12728	212,13	18,113	2,993	19006	316,77	9,163	2,507	26660	444,33	7,755	2,545
				12771	212,85	18,228	3,003	19049	317,48	9,202	2,513	26703	445,05	7,778	2,549
								19092	318,20	9,241	2,519	26746	445,77	7,802	2,553
								19135	318,92	9,280	2,524	26789	446,48	7,825	2,557
								19178	319,63	9,319	2,530	26832	447,20	7,849	2,561
								19221	320,35	9,358	2,536	26875	447,92	7,873	2,565
								19264	321,07	9,398	2,542	26918	448,63	7,896	2,569
								19307	321,78	9,437	2,547	26961	449,35	7,920	2,573
								19350	322,50	9,477	2,553	27004	450,07	7,944	2,577
								19393	323,22	9,516	2,559	27047	450,78	7,968	2,582
								19436	323,93	9,556	2,564	27090	451,50	7,991	2,586
								19479	324,65	9,596	2,570	27133	452,22	8,015	2,590
								19522	325,37	9,636	2,576	27176	452,93	8,039	2,594
								19565	326,08	9,676	2,581	27219	453,65	8,063	2,598
								19608	326,80	9,716	2,587	27262	454,37	8,087	2,602
								19651	327,52	9,756	2,593	27305	455,08	8,111	2,606
								19694	328,23	9,796	2,598	27348	455,80	8,135	2,610
								19737	328,95	9,836	2,604	27391	456,52	8,159	2,614
								19780	329,67	9,876	2,610	27434	457,23	8,183	2,619
								19823	330,38	9,917	2,615	27477	457,95	8,207	2,623
								19866	331,10	9,957	2,621	27520	458,67	8,232	2,627
								19909	331,82	9,998	2,627	27563	459,38	8,256	2,631
								19952	332,53	10,038	2,632	27606	460,10	8,280	2,635
								19995	333,25	10,079	2,638	27649	460,82	8,304	2,639
								20038	333,97	10,120	2,644	27692	461,53	8,329	2,643
								20081	334,68	10,161	2,649	27735	462,25	8,353	2,647
								20124	335,40	10,202	2,655	27778	462,97	8,377	2,651
								20167	336,12	10,243	2,661	27821	463,68	8,402	2,655
								20210	336,83	10,284	2,666	27864	464,40	8,426	2,660
								20253	337,55	10,325	2,672	27907	465,12	8,451	2,664
								20296	338,27	10,366	2,678	27950	465,83	8,475	2,668
								20339	338,98	10,408	2,683	27993	466,55	8,500	2,672
								20382	339,70	10,449	2,689	28036	467,27	8,524	2,676
								20425	340,42	10,491	2,695	28079	467,98	8,549	2,680
								20468	341,13	10,532	2,700	28122	468,70	8,574	2,684
								20511	341,85	10,574	2,706	28165	469,42	8,598	2,688
								20554	342,57	10,616	2,712	28208	470,13	8,623	2,692
								20597	343,28	10,658	2,717	28251	470,85	8,648	2,697
								20640	344,00	10,699	2,723	28294	471,57	8,673	2,701
								20683	344,72	10,741	2,729	28337	472,28	8,697	2,705
								20726	345,43	10,783	2,734	28380	473,00	8,722	2,709
								20769	346,15	10,826	2,740	28423	473,72	8,747	2,713
								20812	346,87	10,868	2,746	28466	474,43	8,772	2,717
								20855	347,58	10,910	2,751	28509	475,15	8,797	2,721
								20898	348,30	10,953	2,757	28552	475,87	8,822	2,725
								20941	349,02	10,995	2,763	28595	476,58	8,847	2,729
								20984	349,73	11,038	2,768	28638	477,30	8,872	2,733
								21027	350,45	11,080	2,774	28681	478,02	8,897	2,738
								21070	351,17	11,123	2,780	28724	478,73	8,923	2,742
								21113	351,88	11,166	2,785	28767	479,45	8,948	2,746
								21156	352,60	11,209	2,791	28810	480,17	8,973	2,750
								21199	353,32	11,251	2,797	28853	480,88	8,998	2,754
								21242	354,03	11,294	2,802	28896	481,60	9,023	2,758
								21285	354,75	11,338	2,808	28939	482,32	9,049	2,762
								21328	355,47	11,381	2,814	28982	483,03	9,074	2,766
								21371	356,18	11,424	2,819	29025	483,75	9,099	2,770
								21414	356,90	11,467	2,825	29068	484,47	9,125	2,774
								21457	357,62	11,511	2,831	29111	485,18	9,150	2,779
								21500	358,33	11,554	2,836	29154	485,90	9,176	2,783
								21543	359,05	11,598	2,842	29197	486,62	9,201	2,787
								21586	359,77	11,641	2,848	29240	487,33	9,227	2,791
								21629	360,48	11,685	2,854	29283	488,05	9,252	2,795
								21672	361,20	11,729	2,859	29326	488,77	9,278	2,799
								21715	361,92	11,773	2,865	29369	489,48	9,304	2,803
								21758	362,63	11,817	2,871	29412	490,20	9,329	2,807
								21801	363,35	11,861	2,876	29455	490,92	9,355	2,811
								21844	364,07	11,905	2,882	29498	491,63	9,381	2,816

Medium: water at 65°C 1 mbar/m = 100 Pa/m Water velocity max. 3 m/s

	40 x 3,5			50 x 4			63 x 4,5			75 x 6		
Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed	Flow		Pressure loss	Speed
l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)	l/h	l/min	Mbar	v(m/s)
								21887	364,78	11,949	2,888	29541	492,35	9,407	2,820
								21930	365,50	11,994	2,893	29584	493,07	9,432	2,824
								21973	366,22	12,038	2,899	29627	493,78	9,458	2,828
								22016	366,93	12,082	2,905	29670	494,50	9,484	2,832
								22059	367,65	12,127	2,910	29713	495,22	9,510	2,836
								22102	368,37	12,171	2,916	29756	495,93	9,536	2,840
								22145	369,08	12,216	2,922	29799	496,65	9,562	2,844
								22188	369,80	12,261	2,927	29842	497,37	9,588	2,848
								22231	370,52	12,306	2,933	29885	498,08	9,614	2,852
								22274	371,23	12,351	2,939	29928	498,80	9,640	2,857
								22317	371,95	12,396	2,944	29971	499,52	9,666	2,861
								22360	372,67	12,441	2,950	30014	500,23	9,693	2,865
								22403	373,38	12,486	2,956	30057	500,95	9,719	2,869
								22446	374,10	12,531	2,961	30100	501,67	9,745	2,873
								22489	374,82	12,576	2,967	30143	502,38	9,771	2,877
								22532	375,53	12,622	2,973	30186	503,10	9,798	2,881
								22575	376,25	12,667	2,978	30229	503,82	9,824	2,885
								22618	376,97	12,713	2,984	30272	504,53	9,850	2,889
								22661	377,68	12,759	2,990	30315	505,25	9,877	2,894
								22704	378,40	12,804	2,995	30358	505,97	9,903	2,898
								22747	379,12	12,850	3,001	30401	506,68	9,930	2,902
												30444	507,40	9,956	2,906

Medium: water at 65°C 1 mbar/m = 100 Pa/m Water velocity max. 3 m/s