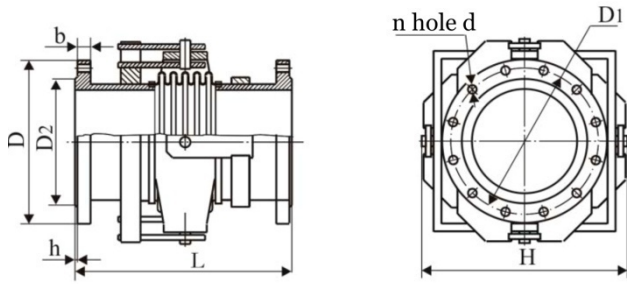


# Expansion joints, ППФН type

## ППФН type



ППФН type double-plane (cardan) expansion joints with flanges. These expansion joints can be installed directly in pipelines transferring (delivery and potable) water with a temperature up to 150 °C and at a velocity up to 8 m/s, oil and oil products with a temperature up to 450 °C and at a velocity up to 8 m/s, as well as steam and gaseous media not causing corrosion to the expansion joint material, with a temperature up to 500 °C and at a velocity up to 20 m/s.

Table 20\*

Serial product range\*\*

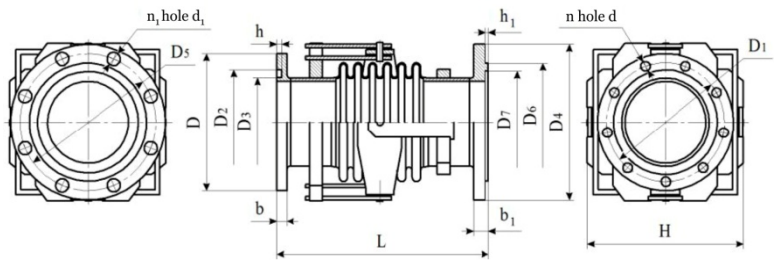
Reference designation	Nominal pressure, PN, MPa (kgf/cm <sup>2</sup> )	Nominal diameter, DN, mm	Dimensions, mm									Angular travel amplitude, ±γ, degr. at an operation time		Stiffness at angular movement, C <sub>γ</sub> N <sub>0</sub> /m/deg. (kgf*m/deg.)	Weight, kg	
			n										Mode 1 N = 5000 cycles			Mode 2 N = 200 cycles
			D	D <sub>1</sub>	D <sub>2</sub>	L	H	b	h	d						
ППФН.Т10-16-65	1.6 (16)	65	180	145	122	418	280	21	3	18	4	8	15	4	38	
ППФН.Т10-16-80		80	195	160	133	446	290	21	3	18	8	8	15	5	42	
ППФН.Т10-16-100		100	215	180	158	458	320	23	3	18	8	8	15	6	57	
ППФН.Т10-16-125		125	245	210	184	526	350	25	3	18	8	8	15	12	70	
ППФН.Т10-16-150		150	280	240	212	536	380	25	3	22	8	8	13	19	93	
ППФН.Т10-16-200		200	335	295	268	546	460	27	3	22	12	8	12	44	143	
ППФН.Т10-16-250		250	405	355	320	612	550	28	3	26	12	8	11	61	213	
ППФН.Т10-16-300		300	460	410	370	660	630	28	4	26	12	8	10	100	301	
ППФН.Т10-16-350		350	520	470	430	702	690	30	4	26	16	7	10	197	384	
ППФН.Т10-16-400		400	580	525	482	848	740	34	4	30	16	5	9	304	479	
ППФН.Т10-16-500		500	710	650	585	886	863	44	4	33	20	5	8	426	715	
ППФН.Т10-16-600		600	840	770	685	946	997	45	5	39	20	5	8	816	1014	
ППФН.Т10-16-700		700	910	840	800	990	1100	47	5	39	24	5	8	1155	1294	
ППФН.Т10-16-800		800	1020	950	905	1080	1230	49	5	39	24	5	8	1394	1719	
ППФН.Т10-25-65		2.5 (25)	65	180	145	122	430	280	21	3	18	8	8	15	6	47
ППФН.Т10-25-80			80	195	160	133	458	290	23	3	18	8	8	15	7	58
ППФН.Т10-25-100	100		230	190	158	470	320	25	3	22	8	8	15	9	78	
ППФН.Т10-25-125	125		270	220	184	536	360	27	3	26	8	8	15	16	109	
ППФН.Т10-25-150	150		300	250	212	546	400	27	3	26	8	8	13	26	141	
ППФН.Т10-25-200	200		360	310	278	578	480	29	3	26	12	8	12	55	197	
ППФН.Т10-25-250	250		425	370	335	620	550	31	3	30	12	8	11	77	289	
ППФН.Т10-25-300	300		485	430	390	670	630	32	4	30	16	8	10	120	414	
ППФН.Т10-25-350	350		550	490	450	710	690	38	4	32	16	7	10	229	518	
ППФН.Т10-25-400	400		610	550	505	858	777	40	4	33	16	5	9	347	663	
ППФН.Т10-25-500	500		730	660	615	898	904	48	4	39	20	5	8	533	919	
ППФН.Т10-25-600	600		845	770	720	964	1030	49	5	39	20	5	8	979	1217	
ППФН.Т10-25-700	700		960	875	820	996	1132	55	5	45	24	5	8	1251	1592	
ППФН.Т10-25-800	800		1075	990	930	1108	1276	63	5	45	24	5	8	1626	2155	

\* The parameters of expansion joints given in the Table are for reference only; for precise product performance please contact the factory's technical specialists;

\*\* The scientific, material and technical facilities, as well as testing equipment of the factory make it possible to supply both serial products and customized products (designed and manufactured according to the customer's ToR).

# Expansion joints, ППФН type

## ППФН type



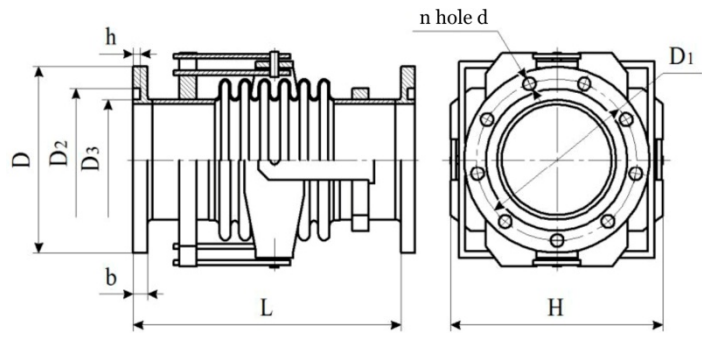
ППФН type double-plane (cardan) expansion joints with flanges. These expansion joints can be installed directly in pipelines transferring (delivery and potable) water with a temperature up to 150 °C and at a velocity up to 8 m/s, oil and oil products with a temperature up to 450 °C and at a velocity up to 8 m/s, as well as steam and gaseous media not causing orrosion to the expansion joint material, with a temperature up to 500 °C and at a velocity up to 20 m/s.

Table 22\*

Serial product range\*\*

Reference designation	Nominal pressure, PN, MPa (kgf/cm <sup>2</sup> )	Nominal diameter, DN, mm	D	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	D <sub>6</sub>	D <sub>7</sub>	L	H	b	b <sub>1</sub>	h	h <sub>1</sub>	d	d <sub>1</sub>	Number of holes, n	Number of holes, n1	Preset operation time, N, cycles	Angular movement amplitude, ±γ, degr. at an operation time N	Stiffness at angular movement, C <sub>γ</sub> , kgf·m/deg.	Weight, kg
ППФН-25-150-2.4	2.5 (25)	150	210	190	174	162	300	250.3	203	183	260	306	15	28	3.5	5	11	25	12	8	3000	3	6.2	39.5

## ППФН type



ППФН type double-plane (cardan) expansion joints with flanges. These expansion joints can be installed directly in pipelines transferring (delivery and potable) water with a temperature up to 150 °C and at a velocity up to 8 m/s, oil and oil products with a temperature up to 450 °C and at a velocity up to 8 m/s, as well as steam and gaseous media not causing corrosion to the expansion joint material, with a temperature up to 500 °C and at a velocity up to 20 m/s.

Table 21\*

Serial product range\*\*

Reference designation	Nominal pressure, PN, MPa (kgf/cm <sup>2</sup> )	Nominal diameter, DN, mm	D	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	L	H	b	h	d	Number of holes, n	Preset operation time, N, cycles	Angular movement amplitude, ±γ, degr. at an operation time N	Stiffness at angular movement, C <sub>γ</sub> , kgf·m/deg.	Weight, kg
ППФН-25-80-2.4	2.5 (25)	80	160	134	106	94	220	200	15	3.5	13	8	3000	2	0.94	12.0
ППФН-25-125-2.4		125	200	171	140	128	270	260	15	3.5	13	10	3000	4	2.2	25.5
ППФН-25-150-2.4		150	210	190	174	162	260	306	15	3.5	11	12	3000	3	6.2	33.0

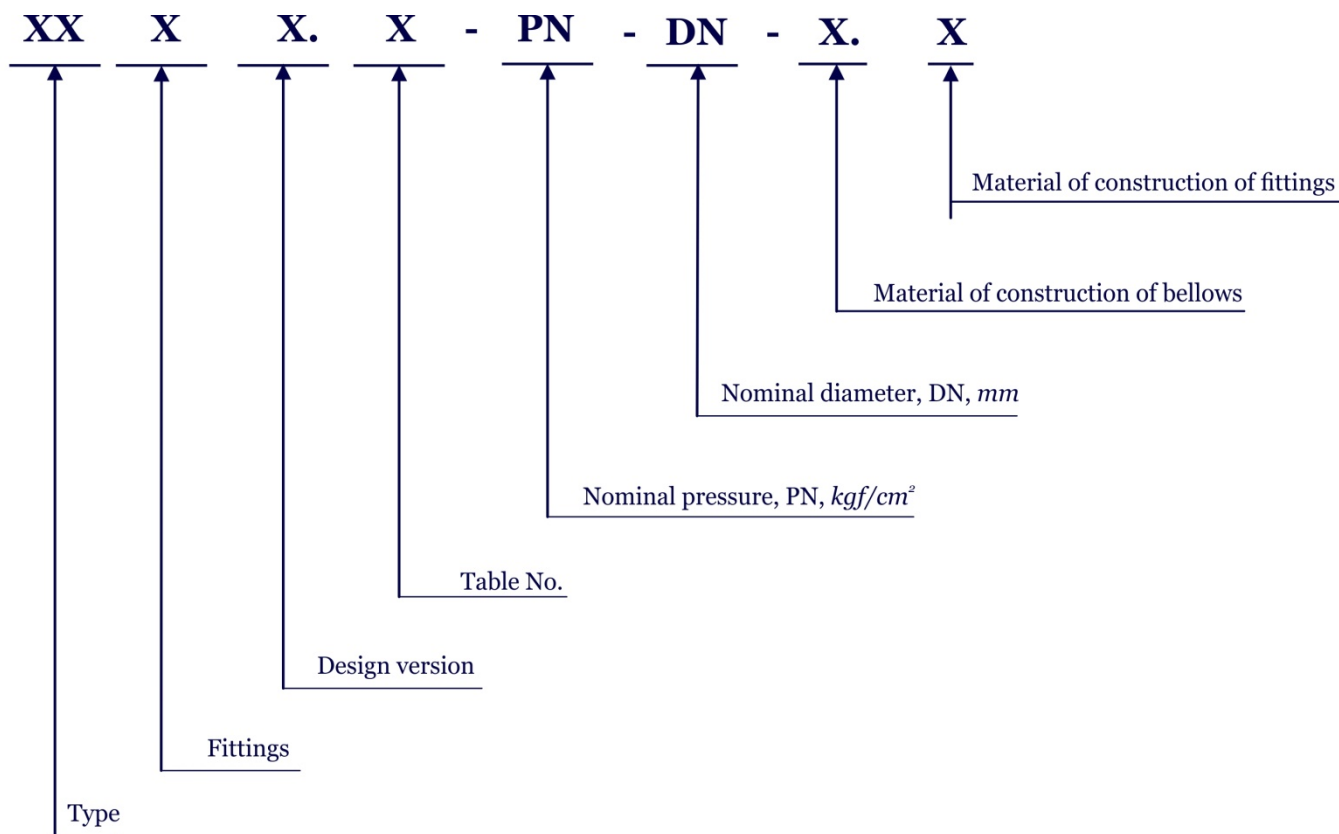
\* The parameters of expansion joints given in the Table are for reference only; for precise product performance please contact the factory's technical specialists;  
 \*\* The scientific, material and technical facilities, as well as testing equipment of the factory make it possible to supply both serial products and customized products (designed and manufactured according to the customer's ToR).

# Reference designation of general purpose industrial grade angular expansion joints as per the ИРНС.300260.046ТУ specification

The reference designation of expansion joints consists of symbols and values of the main parameters:

Reference designation of expansion joint types and versions					
Type	Symbol	Fittings	Symbol	Design version	Symbol
Angular, single-plane	ИО	Weld branch pipe (on both sides)	И	Basic (bellows + 2 branch pipes or flanges)	Н
Angular, space	ИИИ	Flange (on both sides)	Φ	With a guide branch pipe	Г
Lateral, space	СИ	Flange on one side, weld branch pipe on the other side	Д	Enclosed	К
Lateral/angular					
Lateral, single-plane	СО	Weld branch pipe on one side, weld branch on the other side	ОИ	With a guide branch pipe and enclosed	М
Balanced, universal	РУ				

## Expansion joint reference designation diagram



Depending on the operating conditions, the material of construction of expansion joints shall be specified at order placement in accordance with the tables below:

Bellows		
Design version	Material grade	Permissible operating temperature K (°C)
1	– Exterior layers (on the outside) and interior layers (on the side of the handled medium), steel grade 05X18H10T (08X18H10T or 12X18H10T) as per GOST 5632; – Intermediate layers, steel grade 08кп (08пс or 08ю) as per GOST 9045.	253 to 423 (–20 to 150)
2	– All layers, steel grade 05X18H10T (08X18H10T or 12X18H10T) as per GOST 5632;	20 to 773 (–253 to 500)
3	– All layers, steel grade 10X17H13M2T as per GOST 5632	20 to 773 (–253 to 500)

Fittings		
Design version	Material grade	Permissible operating temperature K (°C)
1	Steel grade 20 as per GOST 1050	253 to 698 (–20 to 425)
2	Steel grade 17Г1С as per GOST 19281	233 to 748 (–40 to 475)
3	Steel grade 09Г2С, 09Г2 as per GOST 19281	203 to 748 (–70 to 475)
4	Steel grade 08X18H10T, 12X18H10T as per GOST 5632	20 to 823 (–253 to 550)
5	Steel grade 10X17H13M2T as per GOST 5632	20 to 823 (–253 to 550)
6	Steel grade 15X5M as per GOST 20072	223 to 873 (–50 to 600)

#### Example of ordering information:

Example of ordering information and information to be included in other documentation on an angular space type expansion joint for welded attachment to a pipeline; nominal pressure, PN, 1.6 MPa (16 kgf/cm<sup>2</sup>); nominal diameter, DN, 500 mm; design version; material of bellows construction (all layers, steel grade 05X18H10T); material of construction of fittings (steel grade 20):

“Expansion joint ПППП.Т7-16-500-2.1 as per ИЯНШ.300260.046 ТУ”.

Basic parameters and characteristics of handled media of the products as per ИЯНШ.300260.046ТУ

Handled media	Handled medium temperature, max., K (°C)	Handled medium velocity, m/s
Fresh delivery water, potable water, crude oil, oil products	723 (450)	8 maximum
Steam, natural gas, gaseous media not causing corrosion to expansion joint material	773 (500)	80 maximum
<b>Note:</b> <ol style="list-style-type: none"> <li>The permissible content of chloride ions in fresh water, the handled medium for expansion joints to be installed in heating networks, shall not exceed 250 mg/l.</li> <li>The expansion joints may be used for other handled media not capable of causing sulphide stress corrosion cracking.</li> </ol>		