



# FRN-H TYPE OF GEAR BOX



**FIRE PROTECTION SERVICES GLOBALLY**  
**WE DELIVER ON OUR PROMISES**

UK Office: 85 Great Portland street, First floor, London, United Kingdom,  
Tel +447708 000050

## The characteristics and application

H series right Angle gear box transmits a horizontal shaft power to be vertical pump shaft, it has economy, high efficiency. Save space and suitable for all kinds of weather conditions, etc.

H series right Angle gear box used for diesel engine, horizontal motor and turbine , used for vertical trubine pump,deep weel pump , vertical mix flow pump ,It can also be used for all kinds of vertical shaft mechanical straight.

H series right Angle gear box can be directly worked under mechanical possible axial force, simplify the structure of machine.

It can be widely used in irrigation and water conservancy engineering, municipal engineering, metallurgy, mining, oil chemical industry, fire and Marine engineering and other fields.

Various types of transmission ratio can meet the operating , requirements of high, low speed motor and pump

Vertical shaft speed (r/min)	sheet 1							
	Horizontal shaft rotation speed (r/min) (All the speed transfer efficiency >0.94)							
	1:2	4:7	2:3	3:4	4:5	5:6	10:11	1:1
490	245	280	237	368	392	408	445	490
580	290	331	387	435	464	483	527	580
6690	345	394	460	518	552	575	627	690
720	360	411	480	540	576	600	655	720
860	430	491	573	645	688	717	782	860
960	480	549	640	720	768	800	873	960
1160	580	663	773	870	928	967	1055	1160
1460	730	843	973	1095	1168	1217	1327	1460
1760	880	1006	1173	1320	1408	1467	1600	1760
3460*	1730	1977	2307	2595	2768	2883	3145	3460

Vertical shaft speed (r/min)	sheet 1										
	Horizontal shaft rotation speed (r/min) (All the speed transfer efficiency >0.94)										
	11.10	6.5	5.4	4.3	3.2	7.4	2.1	9.4	5.2	3.1	4.1
490	539	588	613	653	735	858	980	1103	1225	1470	1960
580	638	696	725	733	870	1015	1160	1305	1450	1740	2320
690	759	828	863	920	1035	1208	1380	1553	1725	2070	—
720	792	864	900	960	1080	1260	1440	1620	1800	2160	—
860	946	1032	1075	1147	1290	1505	1720	1935	2150	2580	—
960	1056	1152	1200	1280	1440	1680	1920	2160	2400	2880	—
1160	1276	1392	1450	1547	1740	2030	2320	2610	2900	3480	—
1460	1606	1752	1825	1947	2190	2555	2920	3285	3650	—	—
1760	1936	2112	2200	2347	2640	3080	3520	—	—	—	—

## Parameter selection

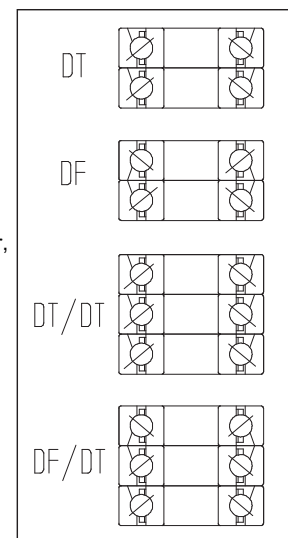
When used to drive the deep well pump, the parameters in sheet 2 have a suitable load coefficient, users can choose directly, other circumstances please consult the company. The USA Gear Manufacturers Association stipulates that the load coefficient of spiral bevel gear should be greater than or equal to 1.5, in different applications, the number of load coefficient are different. In addition, other factors that affect the rated power of the gearbox include bearings, shafts, temperature and lubrication, both have been considered in sheet 2.

The selection of oil cooling mode should take into account the factors such as thrust, rotation speed, ventilation environment and operating conditions. For a gearbox equipped with an oil cooler, its operation should be around 20 degrees Celsius coolant.

## Selection of thrust bearing

Bearings can bear greater thrust and used on the upper part of the vertical shaft (hollow shaft), can meet most of the pump and different head requirements. In most cases, the thrust of the gear box was mainly used to reduce the load of the pump acting on vertical shaft, thrust bearing, thus there is a minimum downward thrust to prevent vertical shaft thrust bearing separation.

Unless otherwise specified, the H series gear boxes are generally arranged in the form of picture DT, which corresponds to the "standard" thrust shown in sheet 2.



If there is a "upward thrust" or "downward thrust" is not enough, can be arranged in the form of DF diagram, corresponding to sheet 2 shows the "two-way" thrust.

If the "downward thrust" over sheet 2 is according to the standard value of thrust, heavy selection, the corresponding to DT/DT layout. Heavy duty also can be arranged according to the DF/D. At this time, the value of downward thrust will be corresponded the value of table 2 "standard" value, and the upward thrust value in table 2 of the "two-way" selection.

## Sheet 2 Thrust value(N)

Model (FRN)	Vertical shaft rotation speed r/min	Power HP/kW	Standard		Heavy type		Two-way
			Single downward thrust				Downward or upward thrust
			Min	Max	Min	Max	
H20	1160	15/11		6230	3337	10200	6230
	1460	17/12.5		5785		9800	5785
	1760	20/15		5340		8900	5340
	3460	30/22		4450		7100	4450
H40	1160	30/22	4000	19580			11500
	1460	35/26	3780	18690			11100
	1760	40/30	3560	17800			10700
H60	860	34/25	6450	26700			16000
	960	38/28	6100	25580			15200
	1160	43/32	5780	24500			14700
	1460	52/38	5560	23100			13800
	1760	60/44	5340	22200			13350
H80	860	46/34	9120	32900	6675	43200	19600
	960	50/37	8980	31540		42100	19100
	1160	58/43	8680	30700		40500	18250
	1460	69/51	8000	28500		36900	16910
	1760	80/60	7560	26700		35600	13350
H110	860	63/46	10450	32900	8000	43200	19600
	960	69/51	9920	31540		42100	19100
	1160	80/60	9790	30700		40500	18250
	1460	95/70	9120	28500		37800	16910
	1760	110/81	8450	26700		35600	13350
H125	720	63/46	12900	37800	12460	54300	22700
	860	72/53	12000	35600	11800	51600	21400
	960	79/58	11780	34790	11560	50400	21000
	1160	90/66	11350	33400	11100	48000	20000
	1460	108/79	10680	31150	10200	44900	18700
1760	125/92	9790	28900	9800	42300	17400	
H150	720	75/55	13570	43600	14000	66750	26250
	860	87/64	13130	41830	13350	63630	24900
	960	95/70	12890	40120	13000	62120	24100
	1160	108/79	12240	39160	12460	59180	23600
	1460	129/95	11570	36930	11570	55620	22250
1760	150/110	11120	35600	11120	53400	21360	
H200	720	100/73.5	16000	53400	15130	72085	30000
	860	116/85	14680	48950	14240	68080	28000
	960	126/93	14100	47680	13920	65610	27000
	1160	144/106	13570	45400	13350	63630	25360
	1460	172/126.5	12680	42270	12680	60000	23580
1760	200/147	12000	40000	12000	57850	22690	

## Sheet 2 Thrust value(N)

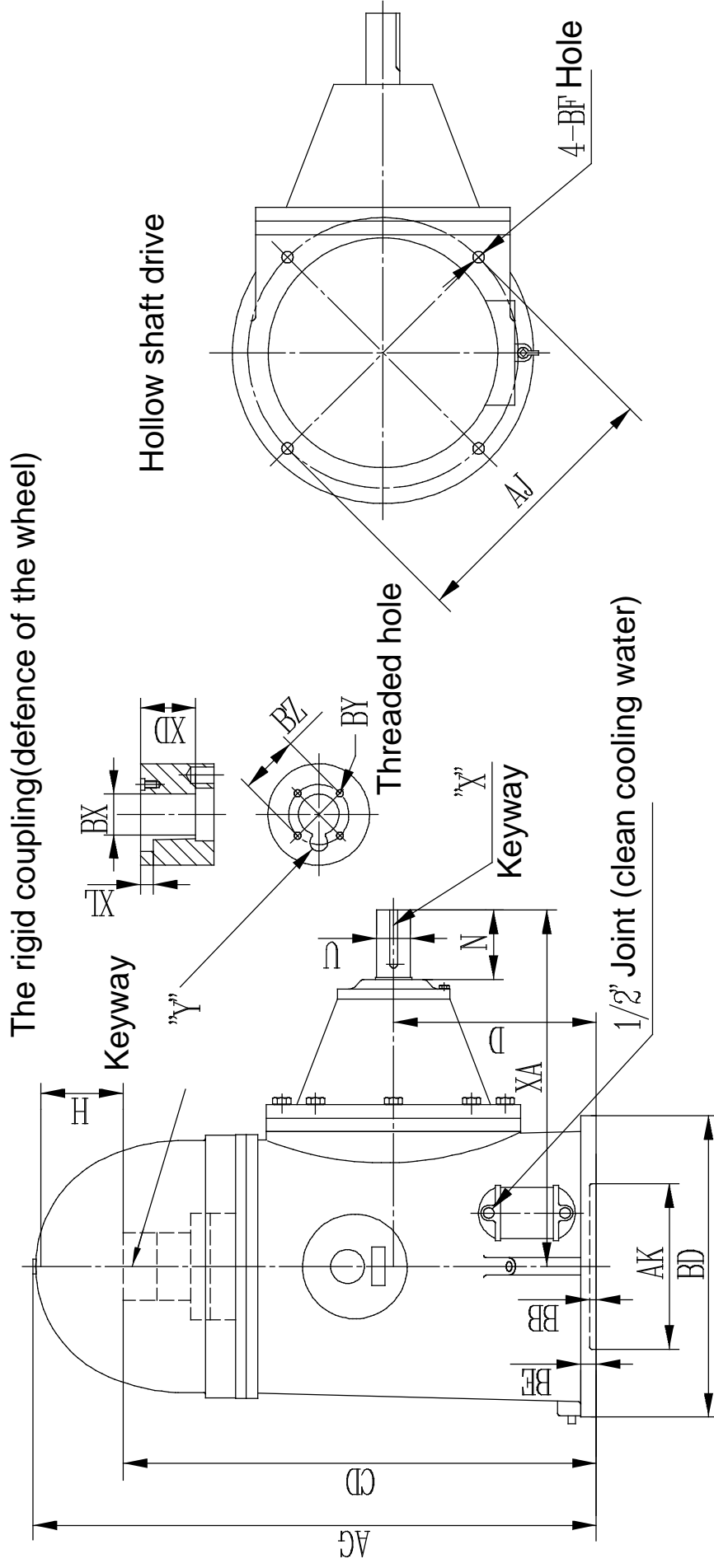
Model (FRN)	Vertical shaft rotation speed r/min	Power HP/kW	Standard		Heavy type		Two-way
			Single downward thrust				Downward or upward thrust
			Min	Max	Min	Max	
H300	720	150/110	16700	60700	16700	83660	36500
	860	174/128	15800	57850	16000	79650	34700
	960	189/139	15500	56100	15600	77210	33200
	1160	216/159	14900	54300	14900	74310	32500
	1460	258/190	14000	51200	14000	69860	30700
	1760	300/220	13350	48950	13350	66750	29400
H350	720	175/129	18900	72530	18700	89000	43600
	860	203/149	18000	68970	17800	84500	41400
	960	221/162	17700	67300	17400	82400	40300
	1160	252/185	16700	64100	16700	79200	38300
	1460	301/221	15800	60500	15600	74300	36500
	1760	350/257	15130	57850	15100	71200	34700
H425	720	213/156.5	20700	83200	21100	111200	49840
	860	246/181	19800	79650	20200	106800	47610
	960	268/197	19100	77230	19700	103700	46510
	1160	306/225	18500	73870	18700	97900	44500
	1460	366/269	17350	69860	17800	93400	41830
	1760	425/312	16900	66750	16900	89000	40050
H500	720	250/184	23360	83200	23360	111200	49840
	860	290/213	22250	79650	22470	106800	47610
	960	315/232	21870	77160	21670	103700	46510
	1160	360/265	20700	73870	20470	97900	44500
	1460	430/316	19580	69860	19580	93400	41830
	1760	500/367.5	18690	66750	18690	89000	40050
H600	720	300/220	24500	89000	24250	115700	53400
	860	348/256	23140	84500	23360	111200	50730
	960	378/278	22670	82400	22770	107100	49720
	1160	432/317	21800	79200	21580	102300	47610
	1460	516/379	20500	74300	20470	97900	44500
	1760	600/441	19580	71200	19580	93400	42720
H750	720	375/276	27600	89000	27800	115700	53400
	860	435/320	26250	84500	26700	111200	50730
	960	473/347	25300	82800	26000	107100	49720
	1160	540/397	24500	79200	24500	102300	47610
	1460	645/474	23140	74300	23580	97900	44500
	1760	750/551	22250	71200	22250	93400	42720
H1000	490	279/205	34500	108000	37500	125000	60000
	580	329/242	32000	102000	34200	120000	57800
	720	408/300	30700	97000	30900	115700	53400
	860	488/359	293640	93400	29700	111200	50730
	960	544/400	28500	91700	29200	107100	49720
	1160	660/485	27600	87300	28500	102300	47610
	1460	830/610	26250	84500	27200	97900	44500
1760	1000/735	24000	79100	25000	93400	42720	
H1360	490	680/500	35000	108000	39600	125000	60000
	580	821/604	32600	102000	35400	120000	57800
	720	1020/750	31200	97000	31800	115700	53400
	860	1217/895	29800	93400	30600	111200	50730
	960	1360/1000	29700	91700	30200	107100	49720
	1160	1643/1208	28200	87300	29500	102300	47610
	1460	2067/1520	26900	84500	28300	97900	44500

## Sheet 2A Power and bearing thrust number at different speeds

Vertical shaft speed (r/min)	490	580	690	720	860	960	1160	1460	1760	2000	2200	2400*	2800*	3000*
When 1760r/min the power of %	30	43	48	50	58	63	72	86	100	105	111	116	128	133
When 1760r/min the thrust of %	150	144	136	134	126	122	115	106	100	96	92	90	85	83

Note: 1. Sheet 2 parameters only for the direction of rotation shown in Fig.1, the other direction of rotation please consult the company;  
2. If the vertical shaft speed exceeds 1760r/min, please contact our company.

Right angle gear box dimensions figure



## Appearance dimension (according to the NAME standard)

## Sheet 3 Appearance dimension (mm)

Model (FRN)	CD	D	U	XA	N	AG	H	BE	BD	AJ	AK	BB	BF	Keyway X (WxH)	Max.BX		XD
															FIG.1,4	FIG.2,3	
H20	368	162	28	330	70	457	76	16	254	232	210	5	11.5	8X3.5X57	25		32
H40	514	228.5	38	406	90	629	102	19	419	375	343	5	18	10X4X70	38	38	45
H60	514	228.5	38	406	90	629	102	19	419	375	343	5	18	10X4X70	40	42	45
H80	514	228.5	48	419	90	629	102	19	419	375	343	5	18	14X4.5X70	40		45
H110	635	289	50	445	90	749	102	25	419	375	343	5	18	14X4.5X70	50	50	54
H125	635	289	50	445	90	749	102	25	419	375	343	5	18	14X4.5X70	50	50	54
H150	762	336.5	60	521	120	876	102	25	508	375	343	5	18	18X5.5X95	55	55	60
H200	762	336.5	60	521	120	876	102	25	508	375	343	5	18	18X5.5X95	55	55	60
H300	870	381	70	610	140	1016	133	29	508	375	343	5	18	20X6X121	60	60	66
H350	978	419	70	737	140	1168	178	32	622	559*	343	10	24	20X6X121	60	60	76
H425	1003	419	75	762	145	1168	159	32	622	559*	343	10	24	20X6X121	60	60	85
H500	1003	419	90	787	170	1168	159	32	622	559*	343	10	24	25X7X140	75	75	85
H600	1080	419	95	838	190	1295	203	32	622	559*	343	10	24	25X7X140	75	80	100
H750	1162	482.5	100	914	190	1372	197	38	775	660	559	10	24	28X8X152	90	90	100
H1000	1405	545	110	1043	210	1610	153	35	920	860	600	7	8-28	28X8X170	100		
H1360	1507	550	130	1290	250	1725	153	35	1250	1180	1120	-5	8-28	32X9X220	110		

Note 1. Heavy-duty thrust transmission size CD and H may have change, please contact with our company.

2. FIG.2~FIG.4 Shown on direction, heavy-duty thrust, and so on will product according to the special order.

3. Tolerance: diameter of shaft U  $^{0}_{-0.025}$ , the base tank AK  $^{+0.08}_{+0.02}$ , coupling hole BX  $^{+0.06}_{+0.02}$ .

## Ordering instructions

User when ordering H series gearbox, please provide the data:

Model: \_\_\_\_\_

Transmission ratio (see sheet 1): \_\_\_\_\_ pump revolution speed: \_\_\_\_\_ r/min, Prime mover speed: \_\_\_\_\_ r/min

Direction of rotation : \_\_\_\_\_ (see FIG.1~FIG.4)

The biggest downward thrust: \_\_\_\_\_ Upward thrust : \_\_\_\_\_ (The minimum thrust down see sheet 2)

The power of shaft: \_\_\_\_\_ Pump shaft diameter (BX): \_\_\_\_\_

Operation mode: continuous \_\_\_\_\_ intermittent \_\_\_\_\_



Model (FRN)	Net W kg	Gross W --- kg			Packing size --mm			volume m <sup>3</sup>
		domestic	container	Plywood box	L	W	H	
H20	55	66	72	80	635	485	940	0.29
H40	110	120	127	135	635	485	940	0.29
H60	115	125	130	140	635	485	940	0.29
H80	130	140	145	155	635	485	940	0.29
H110	175	186	195	200	635	485	940	0.29
H125	180	190	198	205	635	485	940	0.29
H150	290	310	320	330	840	585	1120	0.55
H200	290	310	320	330	840	585	1120	0.55
H300	410	455	455	480	1020	765	1295	1.1
H350	630	680	680	705	1170	765	1320	1.2
H425	720	770	770	795	1170	765	1320	1.2
H500	730	780	780	805	1170	765	1320	1.2
H600	930	1010	-	1050	1270	790	1500	1.5
H750	1370	1480	-	1540	1450	965	1550	2.2
H1000	2200	2480	-	1560	2050	1100	1800	4.1
H1360	2800	3000	-	3080	2200	1450	1950	6.2

Note: Actual weight and size may vary slightly

Sheet 3A: Standard drive parts connection size

Hole BX	Bolt circle BZ	Screw thread BY	Depth XL	Keyway Y( WxH )
Φ25	Φ46	4-M6	9	8×3.3
Φ30	Φ60	4-M8	9	8×3.3
Φ35	Φ60	4-M8	11	10×3.3
Φ40	Φ70	4-M8	13	12×3.3
Φ45	Φ70	4-M8	15	14×3.8
Φ50(H125)	Φ80(H125)	4-M10	15	14×3.8
Φ50	Φ90	4-M10	15	14×3.8
Φ55	Φ90	4-M10	17	16×4.3
Φ60	Φ100	4-M10	19	18×4.4
(Φ65)	(Φ100)	4-M10	19	18×4.4
Φ70	Φ140	4-M10	21	20×4.9
(Φ75)	(Φ140)	4-M10	21	20×4.9
Φ80	Φ140	4-M10	23	22×5.4
Φ90	Φ150	4-M10	26	25×5.4
Φ100	Φ160	4-M10	29	28×6.4
Φ110	Φ160	4-M12	29	28×6.4

Direction of rotation



FIG.1



FIG.2



FIG.3



FIG.4

## Right Angle gear box structure

