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SERIE HTF & HHF

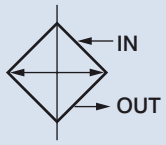
HYDROME

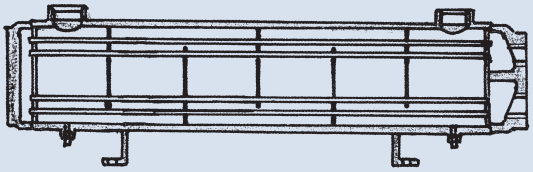
4ManPro
Elements For Manufacturing Processes

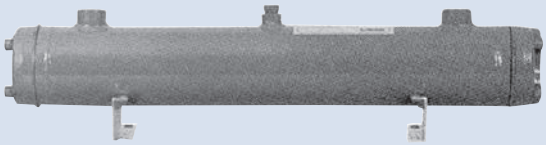
KAORI

高力

FIN TUBE TYPE OIL COOLER
NO-FIN TUBE TYPE OIL COOLER







How to order

HT, HH - 14 05 - ※

1 2 3 4

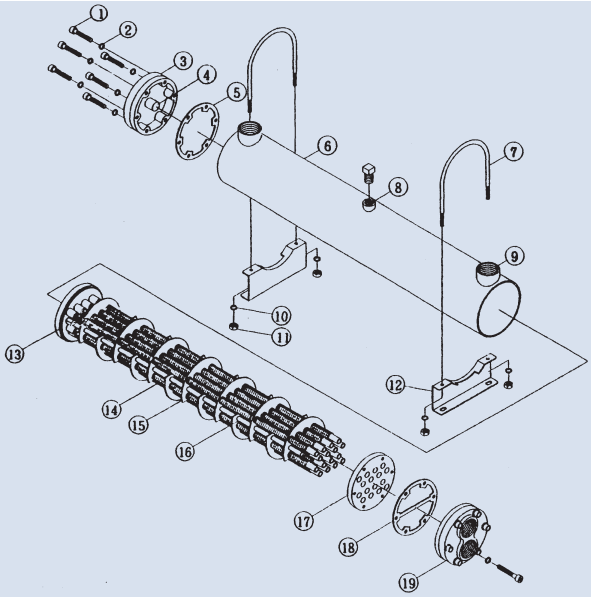
1	Model HT: Fin tube type HH: No-Fin tube type HTF: Fin tube type HHF: No-Fin tube type
2	Shell outside diameter
3	Tube length
4	Cooling water None: Water (standard type) B: Brine water

Specifications

Model	Heat Diffusion Area(m^2)		Flow (lpm)	Weight(kg)	
	HT(F)	HH(F)		HT(F)	HH(F)
HT,HH-0905	0.41	0.24	60	10	10
HT,HH-0908	0.7	0.39	100	14	14
HT,HH-1405	1.1	0.54	150	20	20
HT,HH-1408	1.9	0.84	250	25	26
HT,HH-1412	2.9	1.28	350	37	35
HT,HH-1712	4.6	2.17	600	48	50
HT,HH-1716	6.5	2.89	840	56	60
HT,HH-1722	7.2	3.63	1000	72	72
HTF,HHF-2208	5.6	2.61	800	72	78
HTF,HHF-2212	8.6	4.02	1200	93	110
HTF,HHF-2216	11.6	5.39	1500	118	130
HTF,HHF-2222	14.6	7.15	1800	260	290

Model	Heat Diffusion Area(m^2)		Flow (lpm)	Weight(kg)	
	HTF	HHF		HTF	HHF
HTF,HHF-2508	8	3.55	1000	100	130
HTF,HHF-2512	12.2	5.41	1600	146	170
HTF,HHF-2516	16.4	7.21	1800	168	190
HTF,HHF-2522	20.8	9.08	2200	260	300
HTF-3208	13.3	-	1400	167	-
HTF-3212	20	-	2100	204	-
HTF-3216	26.6	-	2800	241	-
HTF-3222	33.4	-	3500	280	-
HTF-3508	15.5	-	1640	222	-
HTF-3512	23.6	-	2500	264	-
HTF-3516	31.5	-	3300	306	-
HTF-3522	39.6	-	4400	348	-

Dimensions

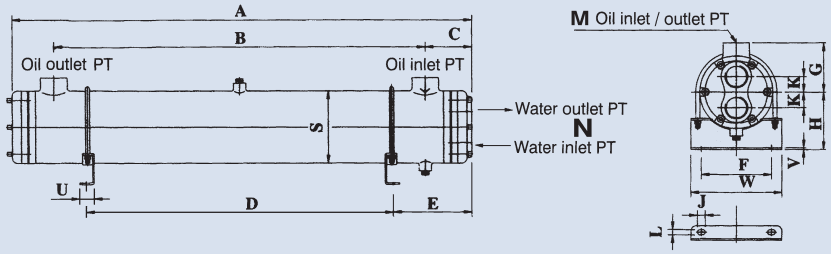


Item	Part name	Material
1	Socket cap screws	SCM (435)
2	Washers	SPM
3	Cast iron end cover	FC20
4	Anti-corrosion zinc bar	ZnB
5	Oil seal	NBR
6	Shell	BPE
7	Supporting hangers	AISI (1006)
8	Air vent	SS41
9	Oil port	STPG (370)
10	Vibration absorber	FWL
11	Nut	STEEL
12	Supporting legs	SS41
13	Tube end plate	SS41
14	Copper tubes	JIS (H3300) (1220T)
15	Buffle plates	SS41
16	Supporting rod	SS41
17	Tube bundle end plate	SS41
18	Oil seal	NBR
19	Cast Iron end cover	FC20

FIN TUBE TYPE OIL COOLER
NO-FIN TUBE TYPE OIL COOLER

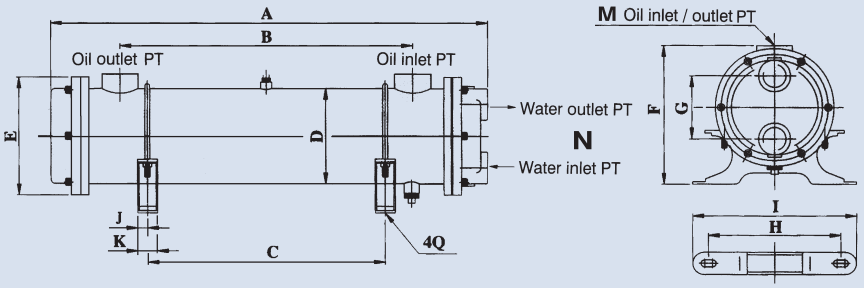
Dimensions

Unit: mm



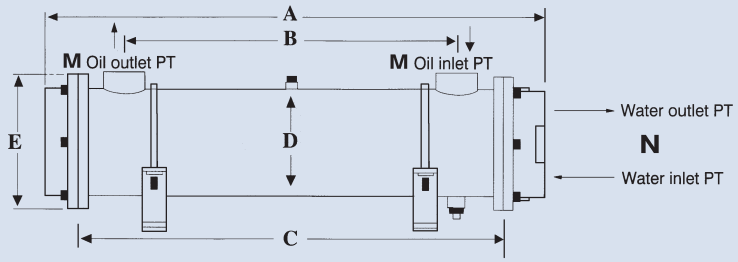
Model	A	B	C	D	E	F	J	G	H	K	L	M	N	S	U	V	W
HT,HH-0905	590	408	88	270	150	80	25	63	80	22	10	3/4"	3/4"	89.5	30	2.3	115
HT,HH-0908	880	720	78	500	190	80	25	63	80	22	10	3/4"	3/4"	89.5	30	2.3	115
HT,HH-1405	600	398	100	270	162	140	32	90	110	28	12	1-1/4"	1/1/4"	140.8	40	3.2	176
HT,HH-1408	890	710	85	500	202	140	32	90	110	28	12	1-1/4"	1-1/4"	140.8	40	3.2	176
HT,HH-1412	1310	1110	100	700	303	140	32	90	110	28	12	1-1/2"	1-1/4"	140.8	40	3.2	176
HT,HH-1712	1335	1060	138	700	310	145	32	115	125	32	12	2"	1-1/4"	166.5	40	3.2	200
HT,HH-1716	1745	1510	118	850	460	145	32	115	125	32	12	2"	1-1/4"	166.5	40	3.2	200
HT,HH-1722	2200	1850	160	1650	270	145	32	115	125	32	12	2	1-1/4"	166.5	40	3.2	200

Unit: mm



Model	A	B	C	D	E	F	G	H	I	J	K	M	N	Q
HTF,HHF-2208	950	640	ADJ.	219	265	323	137	290	360	38	50	2"~2-1/2"	1-1/2"~2"	5/8"
HTF,HHF-2212	1370	1060	ADJ.	219	265	323	-	-	-	-	-	2"~2-1/2"	1-1/2"~2"	5/8"
HTF,HHF-2216	1780	1490	ADJ.	219	265	323	-	-	-	-	-	2"~2-1/2"	1-1/2"~2"	5/8"
HTF,HHF-2222	2210	1860	ADJ.	219	265	323	-	-	-	-	-	2"~2-1/2"	1-1/2"~2"	5/8"
HTF,HHF-2508	980	640	ADJ.	270	325	385	160	345	405	38	50	2"~3"	2"	5/8"
HTF,HHF-2512	1400	1060	ADJ.	270	325	385	160	345	-	-	-	2"~3"	2"	5/8"
HTF,HHF-2516	1810	1470	ADJ.	270	325	385	160	345	-	-	-	2"~3"	2"	5/8"
HTF,HHF-2522	2240	1860	ADJ.	270	325	385	160	345	-	-	-	2"~3"	2"	5/8"

Unit: mm



Model	A	B	C	D	E	M	N
HTF-3208	975	635	810	12"	390	3"~4"	3"~4"
HTF-3212	1400	1060	1235	12"	390	3"~4"	3"~4"
HTF-3216	1810	1470	1645	12"	390	3"~4"	3"~4"
HTF-3222	2235	1895	2070	12"	390	3"~4"	3"~4"

Model	A	B	C	D	E	M	N
HTF-3508	975	635	810	14"	448	3"~4"	3"~4"
HTF-3512	1400	1060	1235	14"	448	3"~4"	3"~4"
HTF-3516	1810	1470	1645	14"	448	3"~4"	3"~4"
HTF-3522	2235	1890	2070	14"	448	3"~4"	3"~4"

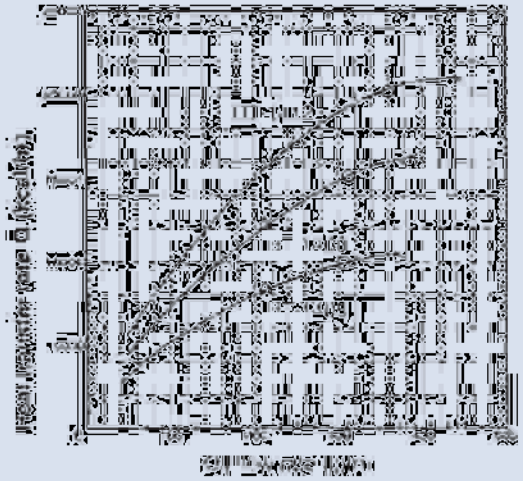
FIN TUBE TYPE OIL COOLER

Performance curves

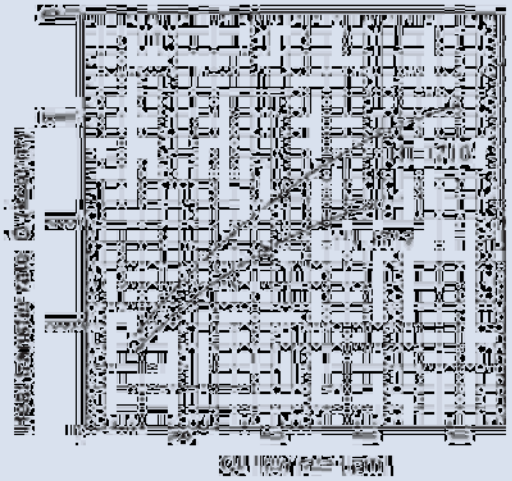
Test conditions:
1. The flow rate of oil is twice as water
2. The outlet temperature of oil: 50 °C
3. The inlet temperature of water: 30 °C
4. The viscosity of oil: ISO-68 (68CST)

Pressure drop of oil:
Δ:ΔP=0.5 bar O: ΔP=1.0 bar X:ΔP=1.5 bar

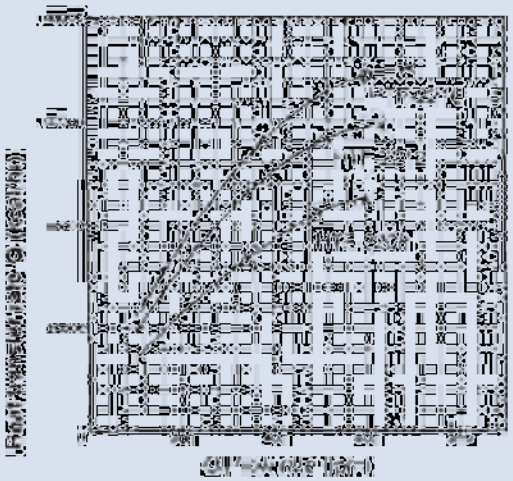
HT-1405, HT-1408, HT-1412



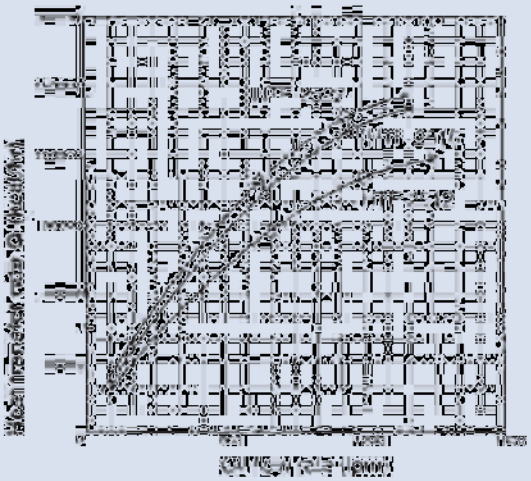
HT-1712, HT-1716



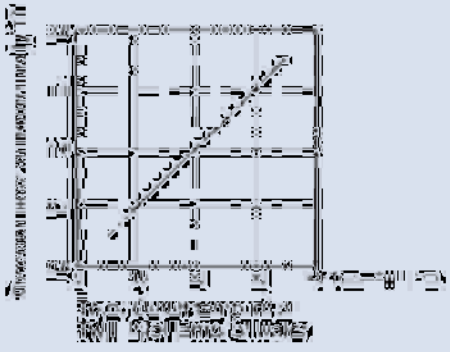
HTF-2208, HTF-2212, HTF-2216



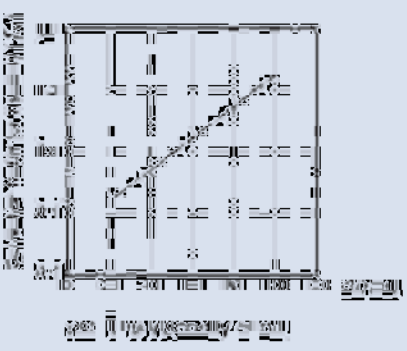
HTF-2512, HTF-2516, HTF-2522



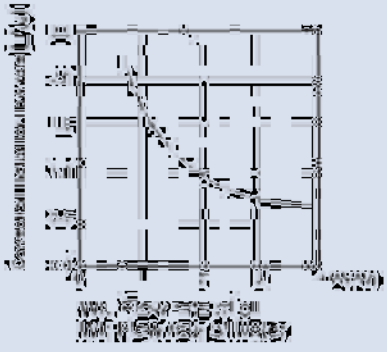
OIL TEMPERATURE CORRECTION



OIL VISCOSITY CORRECTION



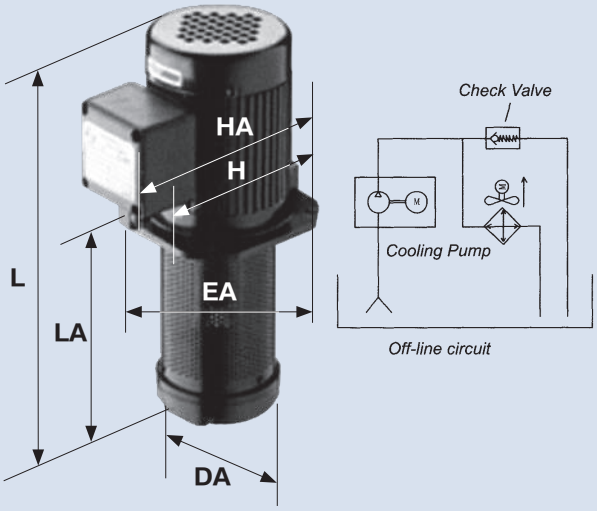
OIL FLOW CORRECTION



COOLING PUMP & ANTI-BURST VALVE

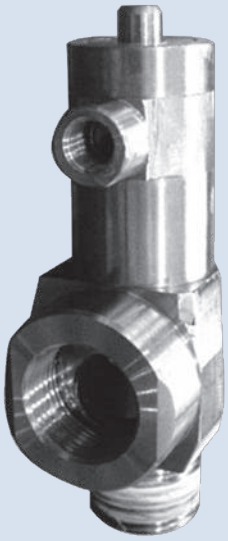
Dimensions

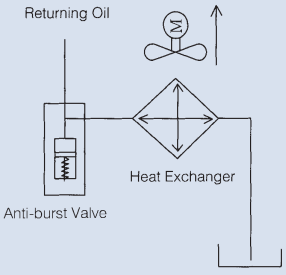
Cooling pump-for off-line circuit



Model	Motor (HP)	Flow Rate (lpm)	L	LA	DA	H	HA	EA	Port (Rc/PT)
TC-6130	1/6	20	275	130	90	124	160	128	1/2"
TC-6180	1/6	20	325	180	90	124	160	128	1/2"
TC-4155	1/4	50	341	155	126	160	191	158	3/4"
TC-4220	1/4	50	406	220	126	160	191	158	3/4"
TC-4350	1/4	50	536	350	126	160	191	158	3/4"
TC-2180	1/2	80	385	180	126	170	196	171	1"
TC-2290	1/2	80	495	290	126	170	196	171	1"
TC-1180	1	120	400	180	151	180	191	185	1"
TC-1240	1	120	460	240	151	180	196	185	1"
TC-1380	1	120	600	380	151	180	196	185	1"

Anti-burst valve - effictive for peak pressure





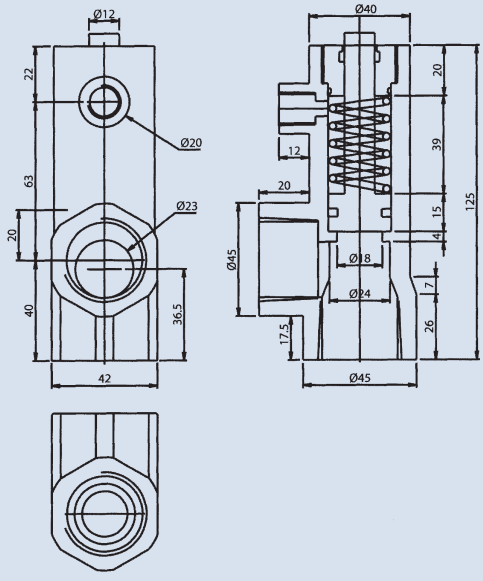


PLATE-FIN HEAT EXCHANGER

INSTALLATION & MAINTENANCE

AH cooler fittings

Option 1. Off-line circuit is strongly recommended

Option 2. Use patent product anti-burst Valve Fig.1 / Fig.2

Option 3. By-pass with check valve (not recommend) Fig.3 / Fig.4

Special notes for option 3

1. The working pressure for AH series is 20 bar.
2. Be carefully the hammering and pulsations pressure which may cause irreversible damage to the cooler.
3. The spring of check valve may crack after a long period of working.

Piping caution

1. Outlet pipe's diameter must match with diameter of the port, and cannot be shrank.
2. Using straight joint or flexible pipe to reduce the feedback resistance.
3. More less of curve and curve angles should be better.

Fig. 1

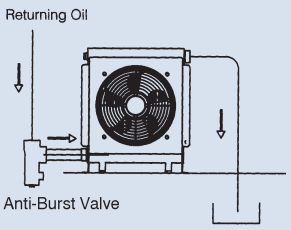


Fig. 2

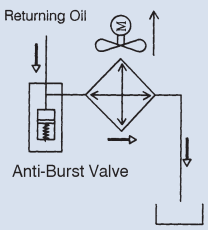


Fig. 3

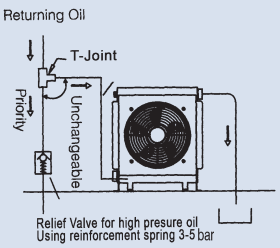
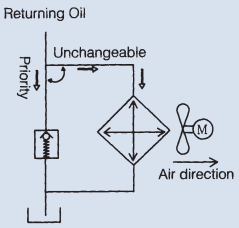


Fig. 4



Conclusion: The feedkback oil goes as smooth or fast as possible, to get a better heat rejection.

Installation

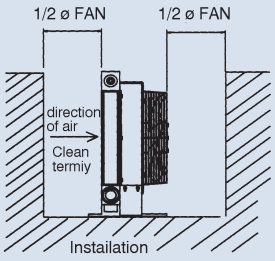
The cooler should be mounted at clean environment where is well ventilated area, keep fan diameter free from both cooling side and hot side.

Avoid locating the cooler at areas where can cause obstruction of air intake or exhaust vent.

Avoid locating the cooler at environment with atmosphere contactining corrosive or flammable dusts, oil mist, conductive power (such as carbon or metal).

If mounted in a closed area, sufficient ventilation must be provided. Heat transfer from the cooling system to ambient air may not increase room temperature, if these conditions are not met, air ducts have to be installed between cooling system and the outside to provide sufficient ventilation.

Check the supply voltage and frequency correspond to the rating plate.



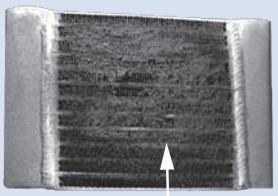
Maintenance

Before maintenance, please make sure to keep the power off.

Ensure that there are no obstacles to the flow of air, either at the intake or at the outlet from the core, please maintain the cooler termly for a longer life.

External cleaning of air side

This can be done by either washing the cooler with a mild cleaner (compatible with aluminum), or with compressed air. A power spray washer works well. Care should be taken not to damage the fins. The direction of stream shall be parallel to the fins in order not to damage it. The cooler needs to be dried completely before restarting operation.



Dust on cooling air inlet side

Internal cleaning of cooler side

The cooler should be disconnected, and a suitable cleaning agent used for removing the type of deposit, yet safe on aluminum should be circulated through the cooler until clean. After cleaning procedure, the cleaning medium shall be completely drained and blown out by means of compressed air.

CALCULATION OF AIR-OIL HEAT EXCHANGER INSTALLED ON HYDRAULIC SYSTEM

Introduction:

First of all, the choice of cooling system needs finding out the heat quantity of the hydraulic system, and furthermore we can design the appropriate cooling mode and ability for the requirements of clients.

The quantity of producing heat on hydraulic system can not be estimated by calculation, because of the different of components and elements, using frequency and the design of circuit make this impossible.

1. Choosing the cooler rely on flow rate is only a basic condition, because we choose the input motor horse power by considering the pressure of pump and flow rate in the meantime.
2. The selecting of cooler depended on the quantity of producing heat matches up with the cooling capability on the system.
3. According to the actuality experience, we could count up the appraised value by inputting 70% electricity energy into the heat quantity. (different engineer and elements make this different.)
4. If we are using more delicate components and less heat quantity product, then the 70% heat quantity could be lower to 60% or much lower. Please confirm to your distributor.
5. If there is hydraulic motor in the circuit, then we should calculate the heat quantity up to 100%.

Data required

1. Simplify

Contrast the input horse power with hydraulic horse power in the performance table, and you could find out the applicable cooler.

2. Calculate

N=installed power in the system (kW)
Q=heat to be dissipated (kcal/h)
To=maximum allowed oil temperature (ºC)
Tamb=ambient temperature (ºC)
Kr: Means the required specific performance of the heat exchanger
Kr=Q/ΔT, ΔT is the difference between oil inlet temperature and summer ambient temperature, while Q is the quantity of heat to be dissipated which can be easily calculated considering 60~100% of installed power.

Example (hydraulic):

N=20 kW To=50 ºC Tamb=35 ºC
Q=70% x 20 kw=14 kW=12040 kcal/h (1kW=860 kcal/h)
ΔT=50-35=15 ºC
Kr=12040 kcal/h÷15 ºC=802 kcal/h ºC=0.93 kW/ºC
The choice of the correct cooler is made by using the diagrams.
You will find in our technical catalogues.

Equivalents among main units

1HP=635kcal/h 1kW=860kcal/h 1cSt=1 mm^2/sec 1BTU=0.25 kcal/h 1bar=100kpa

4ManPro
Mexico Branch Office
Elements For Manufacturing Processes

MEXICO BRANCH OFFICE
Roberto Diaz No. 401
Ciudad Industrial
Aguascalientes, Ags.
México
20290

4ManPro@4ManPro.com
(449) 171 3420
www.4ManPro.com/SPA/

Elements For Manufacturing Processes

USA BRANCH OFFICE
4ManPro®
708 Main St.
10th Floor
Houston, Tx, USA
77002

4ManPro-USA@4ManPro.com
+1 (832) 871 5022
www.4ManPro.com/ENG/

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