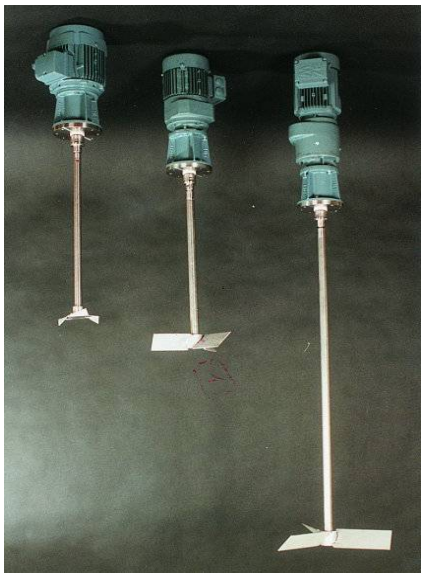
AGITATORS



AGITATORS

APPLICATION

TMI specializes in designing and building mixing apparatus, for working in a very wide range of manufacturing processes:

- Homogenisation
- Slurrying
- Preparing reagents
- In general all the following mixes:
  - > liquid / liquid,
  - > liquid / solid,
  - > liquid / gas.

http://www.tmi.fr
tmi@tmi.fr

TMI

TECHNIQUES DU MELANGE INDUSTRIEL

ZI La Chazotte - F 42353 LA TALAUDIERE
Phone: 33 (0)4 77 53 28 72
Fax: 33 (0)4 77 53 32 44
Export Fax: 33 (0)4 77 53 30 78

AGITATORS

DESIGN

For supplying mixers that are perfectly suited to specific applications, TMI designs all its units in its own design office. On the basis of 3 basic data elements (the type of treatment, the products treated and the volume to be mixed), the mixer is determined together with all its technical characteristics.

All the mixing units made by TMI are fitted with one or more thin-profile impellers for obtaining the best possible hydraulic performance with minimum energy consumption. The different types of impeller profile are determined by our engineers.

A COMPLETE RANGE

Depending on the process, TMI offers 5 types of agitator (see individual datasheets):

- Type A agitators for small volumes used for preparing reagents.
- Type P agitators for physical-chemical processing from 0 to 3000 litres.
- Type F flocculators for flocculation from 100 to 3000 litres.
- M3 agitators for low-speed agitating and flash mixing.
- F3 flocculators for flocculation from 3 to 700 m^3.

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AGITATORS

TYPE A

APPLICATION

TMI recommends this type of apparatus for small volumes and simple stirring operations.

The type of stirrer is determined depending on the unit's use:

- Preparing reagents

- Batch treatment (1h per day).

MOUNTING

The shaft/impeller assembly is driven directly by a motor when high speeds are required (695 rpm). Maximum shaft length: 1m. Low-speed agitators are recommended whenever longer shafts are required.

DRIVE UNITS

Standard motors are: IP 55 – 230/400 V – 3 - 50 Hz – Tropicalized.

MATERIALS

Materials used for making the shaft-impeller assembly depend on the application: Stainless 316 L, UB6 etc.

OPTIONS

- Other voltages

- 60 Hz frequency

- Explosion-proof motor

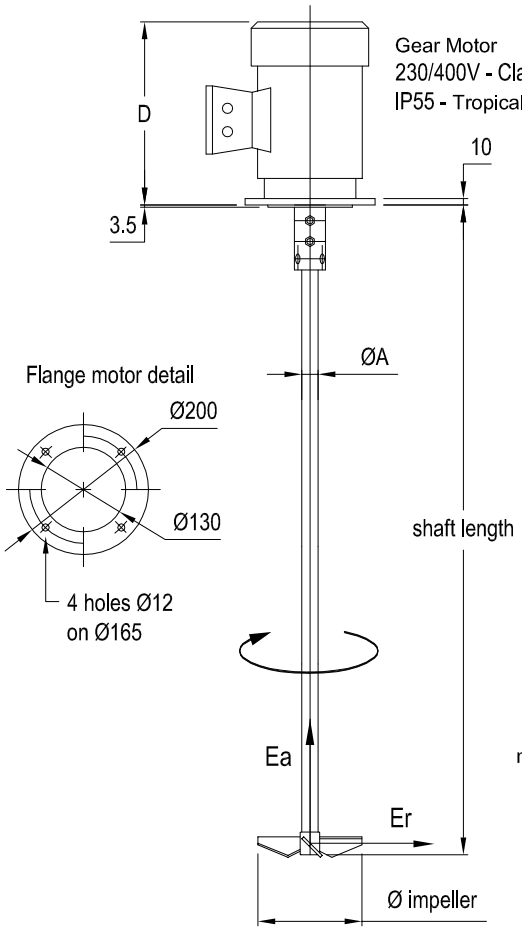
- Compressed air motor.

- Adaptation for mounting plate or clamping system

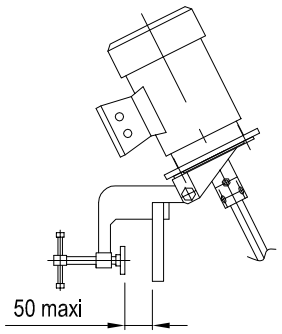
APPLICATION		DECYANURATION	DECHROMATATION	NEUTRALISATION	POST-NEUTRAL.	ACIDIFICATION	FLOCCULANT PREPARATION
VOLUME	MATERIAL	316L	URANUS B6	316L	316L	316L	316L
100 / 200 Litres		AB 18-7	AB 18-7	AB 18-7	AB 18-7	AB 18-7	AB 18-7
300 / 500 Litres		AB 18-8	AB 18-8	AB 18-8	AB 18-8	AB 18-8	AB 18-8
750 / 1000 Litres		AB 110-6	AB 110-6	AB 110-6	AB 110-6	AB 110-6	-

INTERMITTENT OPERATION

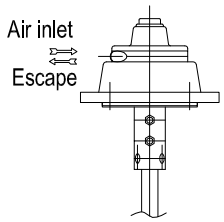
Standard agitator



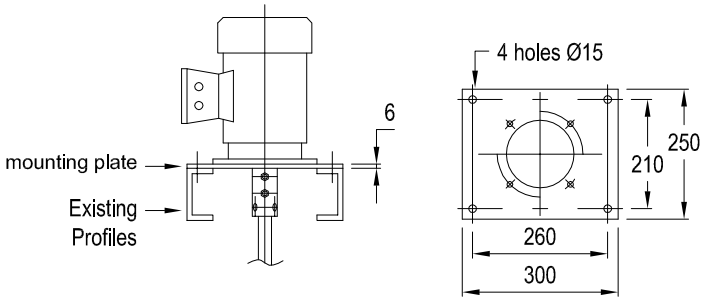
Clamping device adaptation



Compressed air motor adaptation



Mounting plate adaptation



Type	D. impeller	P (kW)	N (rpm)	Q (m3/h)	VH (m/s)	Ea (N)	Er (N)	Weight (kg)	D (mm)	A (mm)
A .. 110-6	160	1.1	895	203	2.8	23	11	20	282	25
A .. 75-6	160	0.75	915	203	2.8	23	11	20	282	25
A .. 18-8	160	0.18	700	152	2.1	13	6	13	234	20
A .. 18-7	120	0.18	700	90	1.6	7	4	13	234	20

Maximum length shaft : 1000 mm

TMI
Tél. : 33 (0)4.77.53.28.72
Fax : 33 (0)4.77.53.32.44
E-mail : tmi@tmi.fr
Web : www.tmi.fr

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AGITATORS

TYPE P

APPLICATION

TMI recommends this type of apparatus for small volumes and simple stirring operations. The type of stirrer is determined depending on the unit's use:

- Preparing reagents
- Homogenising.
- Preparing polyelectrolyte.
- Producing lime slurry...

MOUNTING

All drive unit and agitator arrangements shown on the back page can be supplied.

DRIVE UNITS

Standard motors are: IP 55 – 230/400 V – 3 - 50 Hz – Tropicalized.

MATERIALS

Materials used for making the shaft-impeller assembly depend on the application: Stainless 316 L, UB6 etc.

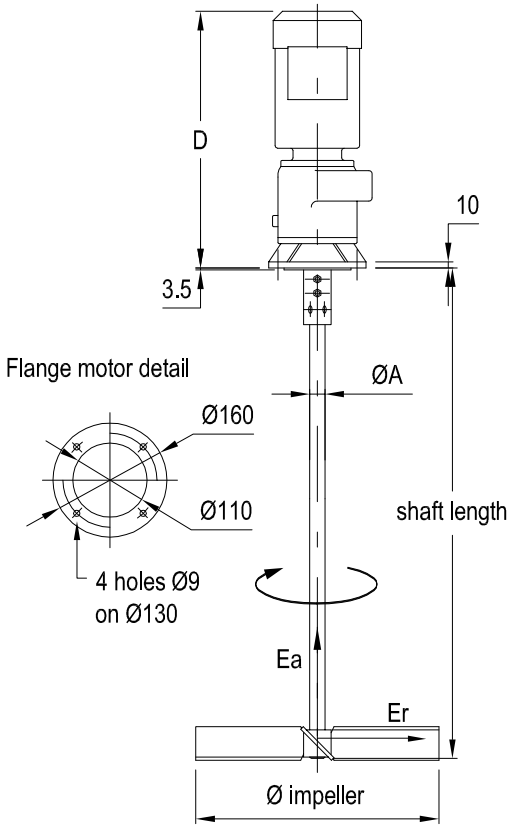
OPTIONS

- Other voltages
- 60 Hz frequency
- Explosion-proof motor
- Compressed air motor
- Rain protector
- Adaptation for mounting plate or clamping system
- Adaptation for 2 turbines

APPLICATION		DECYANURATION	DECHROMATATION	NEUTRALISATION	POST-NEUTRAL.	ACIDIFICATION	FLOCCULANT PREPARATION	LIME SLURRY
VOLUME	MATERIAL	316L	URANUS B6	316L	316L	316L	316L	STEEL
500 Litres		PP 500	PP 500	PP 500	PP 500	PP 500	PP 500	PP 500
750 Litres		PP 750	PP 750	PP 750	PP 750	PP 750	PP 750	PP 750
1000 / 1500 Litres		PP 1000	PP 1000	PP 1000	PP 1000	PP 1000	PP 1000	PP 1000
2000 / 2500 Litres		PP 2000	PP 2000	PP 2000	PP 2000	PP 2000	PP 2000	PP 2000
3000 Litres		PP 3000	PP 3000	PP 3000	PP 3000	PP 3000	PP 3000	PP 3000

CONTINUOUS OPERATION

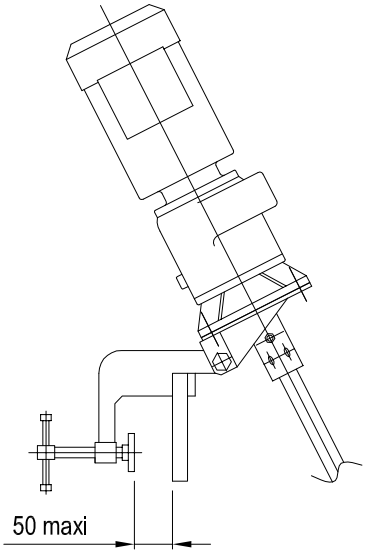
Standard agitator



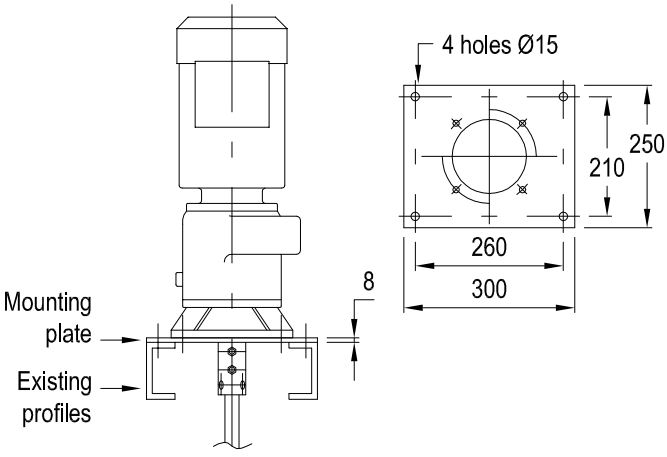
Type	D. impeller	Q (m3/h)	VH (m/s)	N (rpm)	P (kW)	Ea (N)	Er (N)	Weight (kg)	D (mm)	A (mm)
P .. 250	250	90	0.4	102	0.55	5	1	29	430	25
P .. 300	300	150	0.4	102	0.55	6	1	32	430	25
P .. 500	350	180	0.4	102	0.55	6	1	29	430	25
P .. 750	450	250	0.45	102	0.55	9	1.5	32	430	25
P .. 1000	500	350	0.5	102	0.55	10	2	32	430	25
P .. 1200	500	350	0.5	97	1.1	10	2	47	480	30
P .. 1400	500	350	0.5	96	1.5	10	2	50	480	30
P .. 1500	500	350	0.5	102	0.55	10	2	32	430	25
P .. 1600	500	350	0.5	96	2.2	10	2	54	530	30
P .. 2000	550	465	0.55	102	0.55	12	3	33	430	25
P .. 2200	550	465	0.55	97	1.1	12	3	47	480	30
P .. 2400	550	465	0.55	96	1.5	12	3	50	480	30
P .. 2500	600	567	0.6	97	1.1	16	4	47	480	30
P .. 3000	600	623	0.66	97	1.1	16	4	48	490	30
P .. 3200	600	623	0.66	96	1.5	16	4	50	490	30
P .. 3400	600	623	0.66	96	2.2	16	4	54	530	30
P .. 4000	700	780	0.7	96	1.5	30	5	50	480	30
P .. 5000	700	901	0.7	96	2.2	30	5	54	530	30

Maximum length shaft : 1500 mm

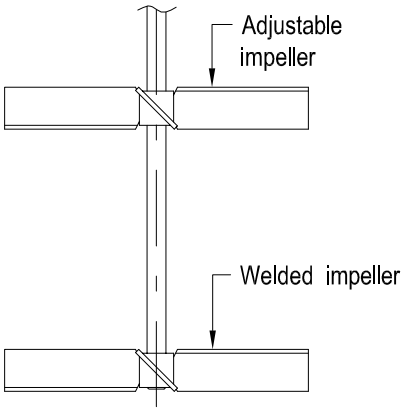
Clamping device adaptation



Mounting plate adaptation



2 impellers adaptation



TMI
Tél. : 33 (0)4.77.53.28.72
Fax : 33 (0)4.77.53.32.44
E-mail : tmi@tmi.fr
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AGITATORS

TYPE M3

APPLICATION

Different water-treatment processes require the use of chemical reagents that need to be prepared, metered and mixed with the effluent.

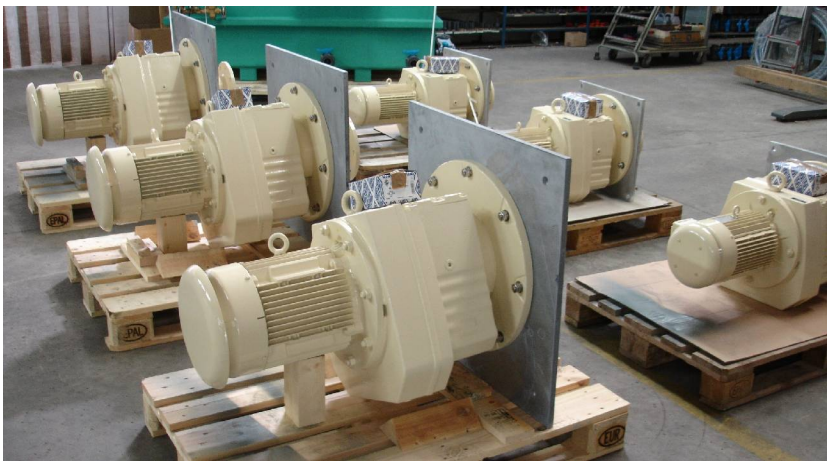
This is the job done by flash-mixing tanks, placed upstream to the flocculating and settling tanks.

The chart on the back of this datasheet helps determine the type of low-speed agitator best-suited to the following applications:

- Preparing reagents
- Neutralizing
- Detoxifying
- Homogenising
- Chemical reactions
-All mixing operations

PRINCIPLE

The effluent stays in the flash-mixing tank for about a minute. During this time, the agitator must provide intense stirring for thoroughly mixing effluent and reagent. Mixers for flash-mixing tanks are determined depending on the volume of the tank and the cross-flow. They must able to operate continuously.



MAIN REAGENTS USED

- Lime
- Iron (III) chloride
- Iron (III) chlorosulphate
- Iron (II) sulphate
- Aluminium sulphate
- Acids
- Liquid or powdered flocculating agents
- Aluminium polyhydrochloride.

DRIVE UNIT

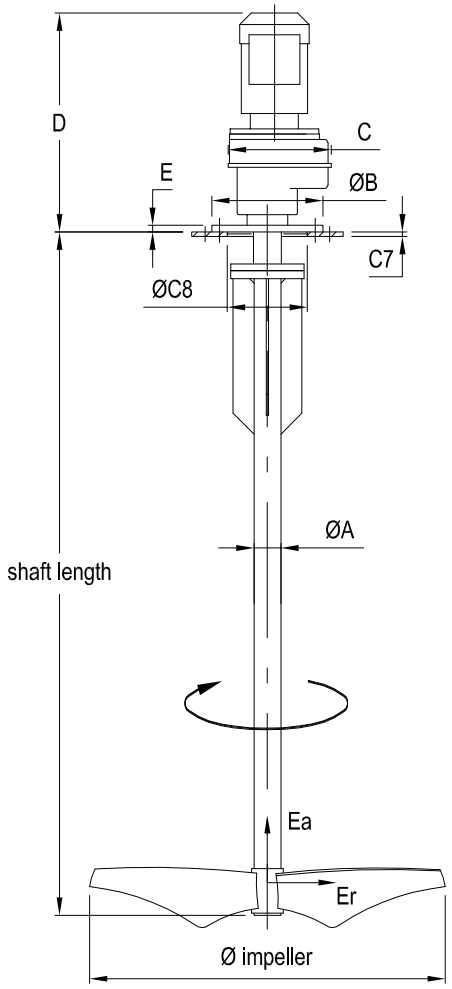
Standard :

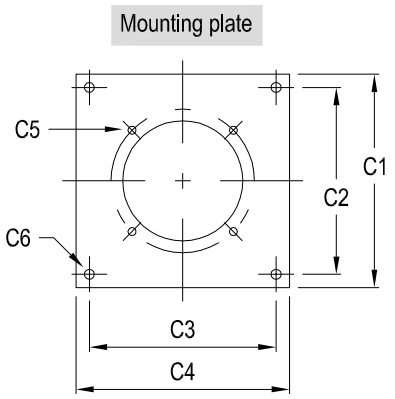
- Geared drive motor 230/400 V – 3 - 50 Hz
- Class F
- Tropicalized.

MATERIALS

Shaft and impeller materials are selected according to the product being treated: steel, stainless, UB 6, ebonite coating, Rilsan, etc.

Type	N (rpm)	D. impeller (mm)	P (kW)	VH (m/s)	Q (m3/h)	Ea (N)	Er (N)	Max. length (mm)	Weight (kg)	Readings (mm) A	B	C	D	E	Mounting plate
M3 96 0402 - 6	96	400	1,1	0,71	322	37	11	1800	55	48	160	190	444	10	
M3 96 0502 - 6	96	500	1,1	0,89	629	89	27	1800	58	48	160	190	444	10	
M3 96 0602 - 6	96	600	1,1	1,07	1087	185	56	1800	59	48	160	190	444	10	P1
M3 96 0702 - 7	96	700	1,5	1,24	1726	343	103	1800	62	48	160	190	444	10	
M3 96 0802 - 8	96	800	2,2	1,42	2576	585	180	1800	65	48	160	190	494	10	
M3 90 0503 - 7	90	500	1,5	0,83	590	78	24	2000	72	60	250	273	81	18,5	
M3 90 0603 - 7	90	600	1,5	1	1019	163	50	2000	73	60	250	273	481	18,5	P2
M3 90 0703 - 7	90	700	1,5	1,17	1618	302	91	2000	74	60	250	273	481	18,5	
M3 90 0803 - 8	90	800	2,2	1,33	2415	514	159	2000	75	60	250	273	531	18,5	
M3 65 0604 - 7	65	600	1,5	0,72	736	85	26	2500	110	89	300	349	529	19,5	
M3 65 0704 - 7	65	700	1,5	0,84	1168	157	47	2500	112	89	300	349	529	19,5	
M3 65 0804 - 7	65	800	1,5	0,96	1744	268	81	2300	115	89	300	349	529	19,5	P3
M3 65 0904 - 7	65	900	1,5	1,08	2483	430	131	2300	117	89	300	349	529	19,5	
M3 65 1004 - 8	65	1000	2,2	1,2	3406	655	198	2300	120	89	300	349	579	19,5	
M3 65 1104 - 9	65	1100	3	1,.32	4534	959	287	2100	125	89	300	349	579	19,5	
M3 63 0905 - 7	63	900	1,5	1,05	2407	404	123	3000	170	89	350	423	571	23,5	
M3 63 1005 - 8	63	1000	2,2	1,17	3302	615	186	2600	180	89	350	423	622	23,5	
M3 63 1205 - 11	63	1200	5,5	1,4	5705	1276	380	2400	210	89	350	423	702	23,5	
M3 57 1006 - 9	57	1000	3	1,06	2987	504	152	3000	240	114	350	479	650	20	P4
M3 57 1106 - 9	57	1100	3	1,16	3976	738	221	3000	245	114	350	479	650	20	
M3 57 1206 - 9	57	1200	3	1,27	5162	1045	311	3000	250	114	350	479	650	20	
M3 57 1306 - 11	57	1300	5,5	1,37	6563	1439	427	2800	290	141	350	479	731	20	
M3 57 1406 - 12	57	1400	7,5	1,48	8197	1935	582	2600	310	141	350	479	731	20	





Mounting plate								
Type	C1	C2	C3	C4	C5	C6	C7	C8
P1	250	210	260	300	4*Ø10 on Ø130	4*Ø15	8	110
P2	320	280	280	320	4*Ø14 on Ø215	4*Ø15	10	180
P3	400	350	350	400	4*Ø14 on Ø265	4*Ø15	12	230
P4	400	350	350	400	4*Ø18 on Ø300	4*Ø18	15	250

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Tél. : 33 (0)4.77.53.28.72
Fax : 33 (0)4.77.53.32.44
E-mail : tmi@tmi.fr
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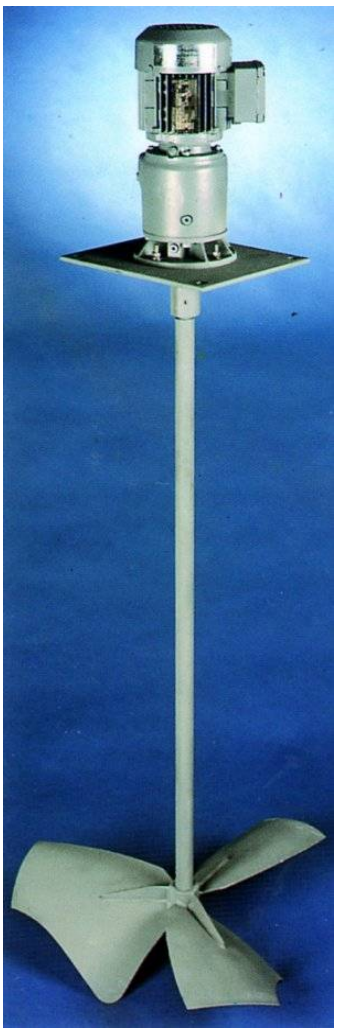
AGITATORS

F-TYPE FLOCCULATORS

APPLICATION



Purifying wastewater using physical-chemical processes is interesting from several points of view: easy adaptation to sudden significant variations in load and to limited installation areas. These benefits are particularly appreciated in tourist areas and in the mountains. This type of water treatment consists in breaking the colloidal state of suspended matter in order to conglomerate and settle particles. Colloidal suspension stability may result from:

- superficial electrostatic charging which induces electrostatic repelling power;

- highly hydrophilic particles.

Suspended matter is destabilized when high valence mineral salts such as iron or

aluminium are added. This type of process generally takes place by means of the hydrous compounds produced when the salt is hydrolyzed.

This phenomenon called coagulation, causes microfloc to appear which are only capable of settling slowly.

The actual flocculation process is due to the presence of normally synthetic organic polymers with high molecular weights, which are adsorbed on the molecule surfaces and produce large floc, which are capable of settling rapidly.

PRINCIPLE

Physical-chemical sewerage plants include a fast mixing chamber in which mineral reagents are mixed to the effluent. Then, water passes through a flocculating tank, where polyelectrolyte is injected at the tank inlet.

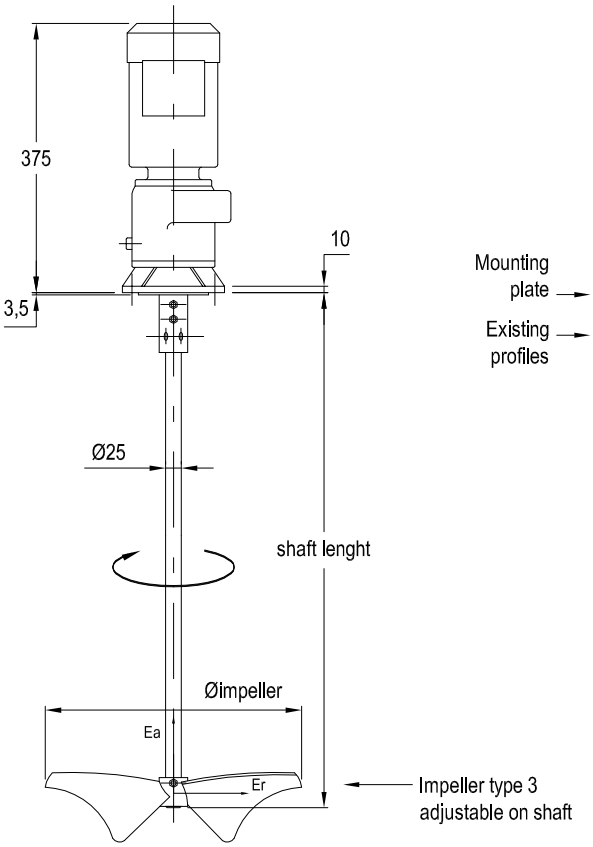
To optimize the effectiveness of the polyelectrolyte, it must be diluted with the effluent and then be stirred gently so that the microfloc is adsorbed on the flocculent molecules by bringing the two elements in contact with each other.

Stirring should be gentle enough to avoid breaking the floc formed, whilst keeping them in suspension at the same time.

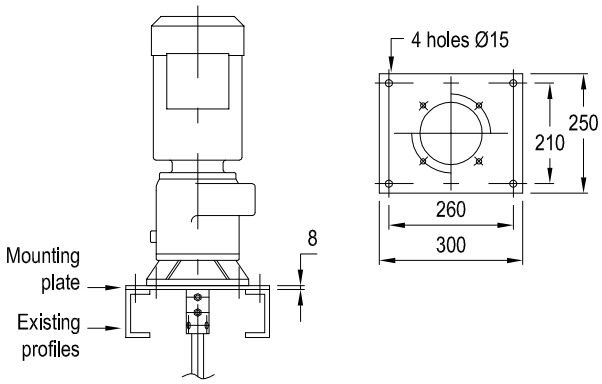
DRIVE UNITS

Geared variable speed motor with IP 55 protection - Class B - Voltage 230/400V 3-phase 50 Hz. Other voltages and 60 Hz frequencies available on request.

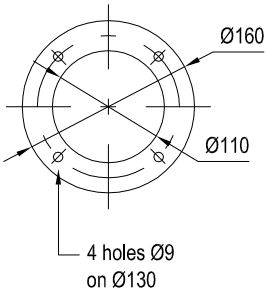
Standard agitator



Mounting plate adaptation



Flange motor detail



Type	D. impeller	P (kW)	N (rpm)	Q (m3/h)	VH (m/s)	Ea (N)	Er (N)	Weight (kg)
FF... 0201	200	0,15	19	8	0,1	-	-	32
			24	10	0,1	-	-	32
			32	13	0,2	1	-	32
FF... 0301	300		19	26	0,1	-	-	32
			24	33	0,1	-	-	32
			32	44	0,2	2	-	32
FF... 0401	400		19	63	0,1	2	-	33
			24	80	0,15	2	-	32
			32	105	0,25	5	1	33
FF... 0501	500		19	122	0,15	5	1	34
			24	155	0,2	4	-	33
			32	205	0,3	14	4	34
FF... 0601	600		19	155	0,2	8	3	35
			24	196	0,24	12	3	34
			32	355	0,35	20	6	35
FF... 0701	700		19	215	0,25	14	5	38
			24	270	0,26	15	4	38
FF... 0801	800		19	370	0,3	16	4	40

Maximum length shaft : 1500 mm

TMI
Tél. : 33 (0)4.77.53.28.72
Fax : 33 (0)4.77.53.32.44
E-mail : tmi@tmi.fr
Web : www.tmi.fr

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AGITATORS

F3 FLOCCULATORS

APPLICATION

Physical-chemical water treatment proves particularly useful as it adapts easily to sudden, important changes in load, and requires only limited installation areas.

This type of water treatment consists of enabling particles to conglomerate together and settle.

Suspended matter is destabilized when high valence mineral salts such as iron or aluminium are added. This type of process generally takes place by means of the hydrous compounds produced when the salt is hydrolyzed.

This phenomenon called coagulation, causes microfloc to appear, which are only capable of settling slowly.

The actual flocculation process is due to the presence of normally synthetic organic polymers with high molecular weights, which are adsorbed on the molecule surfaces and produce large flocs, which are capable of settling rapidly.

ADVANTAGES

TMI thin-profile blade flocculators replace conventional gate systems advantageously.

They guarantee high circulation flows without any turbulence and consume very little energy. The mechanical or electronic variable speed drive delivers

optimum rotation speeds, depending on the nature of effluents and reagents used.

PRINCIPLE

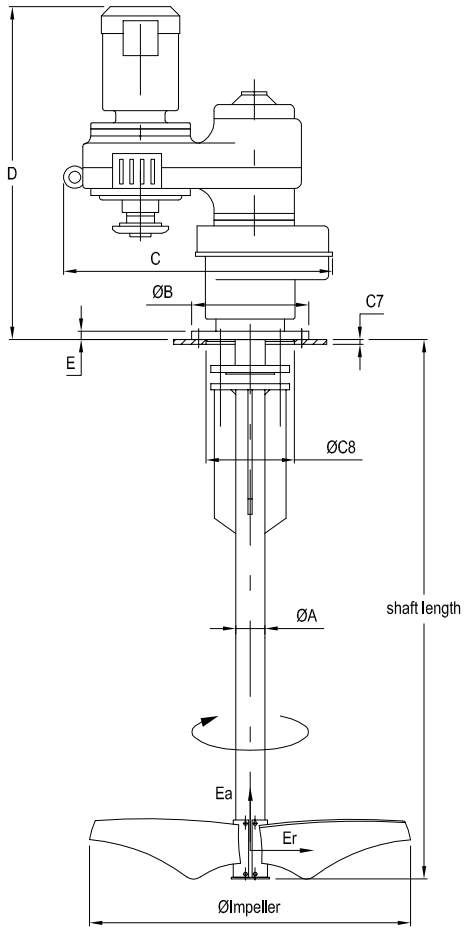
The effluent goes into a flocculating tank, where polyelectrolyte is injected at the inlet point.

To optimize the effectiveness of the polyelectrolyte, it must be diluted with the effluent and then be stirred gently so that the microfloc is adsorbed on the flocculent molecules by bringing the two elements in contact with each other.

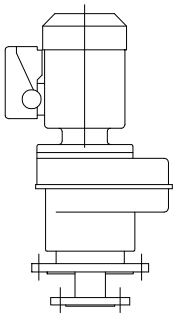
Stirring should be gentle enough to avoid breaking the floc formed, whilst keeping them in suspension at the same time.

TYPE	N (rpm)	D. impeller (mm)	P (kW)	VH (m/s)	Q (m3/h)	Ea/Er (daN)	Max. length (mm)	Weight (kg)	Reading (mm) A	B	C	D	E	Mounting plate
F3 529 0601 - 1	5,5 to 29	600	0,18	0,06 to 0,32	61 to 322	2/1	1500	45	48	160	359	480	10	P1
F3 528 0602 - 1	5,3 to 28	600	0,1800	0,06 to 0,31	59 to 310	2/1	2000	60	48	160	388	513	10	P1
F3 529 0801 - 1	5,5 to 29	800	0,18	0,08 to 0,42	145 to 763	6/2	1500	47	48	160	359	480	10	P1
F3 528 0802 - 1	5,3 to 28	800	0,18	0,08 to 0,40	140 to 737	6/2	2000	63	48	160	388	513	10	P1
F3 320 1002 - 1	3,9 to 20	1000	0,18	0,07 to 0,36	190 to 1027	6/2	1800	65	48	160	388	513	10	P1
F3 319 1003 - 1	3,7 to 19,5	1000	0,18	0,05 to 0,35	190 to 1000	6/2	2000	85	60	250	411	681	15	P2
F3 320 1302 - 2	3,7 to 20	1300	0,25	0,08 to 0,47	417 to 2260	16/5	1800	70	48	160	388	513	10	P1
F3 319 1303 - 2	3,7 to 19,5	1300	0,25	0,08 to 0,46	417 to 2200	16/5	2000	90	60	250	411	681	15	P2
F3 215 1502 - 2	2,8 to 15	1500	0,25	0,08 to 0,41	485 to 2600	20/6	1800	80	48	160	388	687	10	P1
F3 215 1503 -2	2,8 to 15	1500	0,25	0,08 to 0,41	485 to 2600	20/6	2000	90	60	250	411	681	15	P2
F3 213 1802 - 3	2,6 to 13,7	1800	0,37	0,09 to 45	780 to 4105	30/9	1800	95	60	160	387	697	10	P1
F3 213 1803 - 4	2,5 to 13,6	1800	0,55	0,09 to 0,45	749 to 4075	30/9	2000	105	48	250	411	691	15	P2
F3 211 2003 - 4	2,1 to 11,2	2000	0,55	0,08 to 0,41	863 to 4600	40/11	2000	130	60	250	387	747	15	P2
F3 212 2004 - 4	2 to 12	2000	0,55	0,08 to 0,44	822 to 4930	40/11	2500	160	89	300	411	820	16	P3
F3 19 2203 - 4	1,8 to 9,7	2200	0,55	0,07 to 0,39	985 to 5307	44/13	2000	145	60	250	387	747	15	P2
F3 110 2204 - 4	1,9 to 10,6	2200	0,55	0,08 to 0,42	1040 to 5800	44/13	2500	175	89	300	452	820	16	P3
F3 19 2504 - 4	1,6 to 9,2	2500	0,55	0,07 to 0,42	1285 to 7390	46/14	2500	200	89	300	452	820	16	P3
F3 19 2505 - 4	1,7 to 9,9	2500	0,55	0,08 to 0,45	1365 to 7940	46/14	3500	240	89	350	494	867	18	P4
F3 19 2804 - 5	1,6 to 9,2	2800	0,75	0,08 to 0,47	1805 to 10380	71//21	2500	250	89	300	452	820	16	P3
F3 19 2805 - 5	1,6 to 9,3	2800	0,75	0,08 to 0,47	1800 to 10500	71/21	3500	290	89	350	494	867	18	P4
F3 17 3004 - 5	1,4 to 7,5	3000	0,75	0,07 to 0,41	1950 to 10400	83/24	2500	280	89	300	452	820	16	P3
F3 17 3005 - 5	1,2 to 7,3	3000	0,75	0,06 to 0,40	1660 to 10310	3 7/16	3500	320	89	350	494	867	18	P4

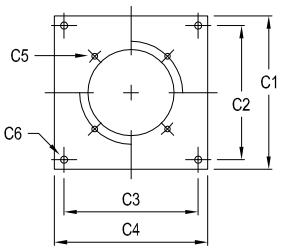
TYPE F3
Mechanical variable speed



TYPE F3V
Electronic variable speed



Mounting plate



Mounting plate								
Type	C1	C2	C3	C4	C5	C6	C7	C8
P1	250	210	260	300	4*Ø10 on Ø130	4*Ø15	8	110
P2	320	280	280	320	4*Ø14 on Ø215	4*Ø15	10	180
P3	400	350	350	400	4*Ø14 on Ø265	4*Ø15	12	230
P4	400	350	350	400	4*Ø18 on Ø300	4*Ø18	15	250

TMI
Tél. : 33 (0)4.77.53.28.72
Fax : 33 (0)4.77.53.32.44
E-mail : tmi@tmi.fr
Web : www.tmi.fr