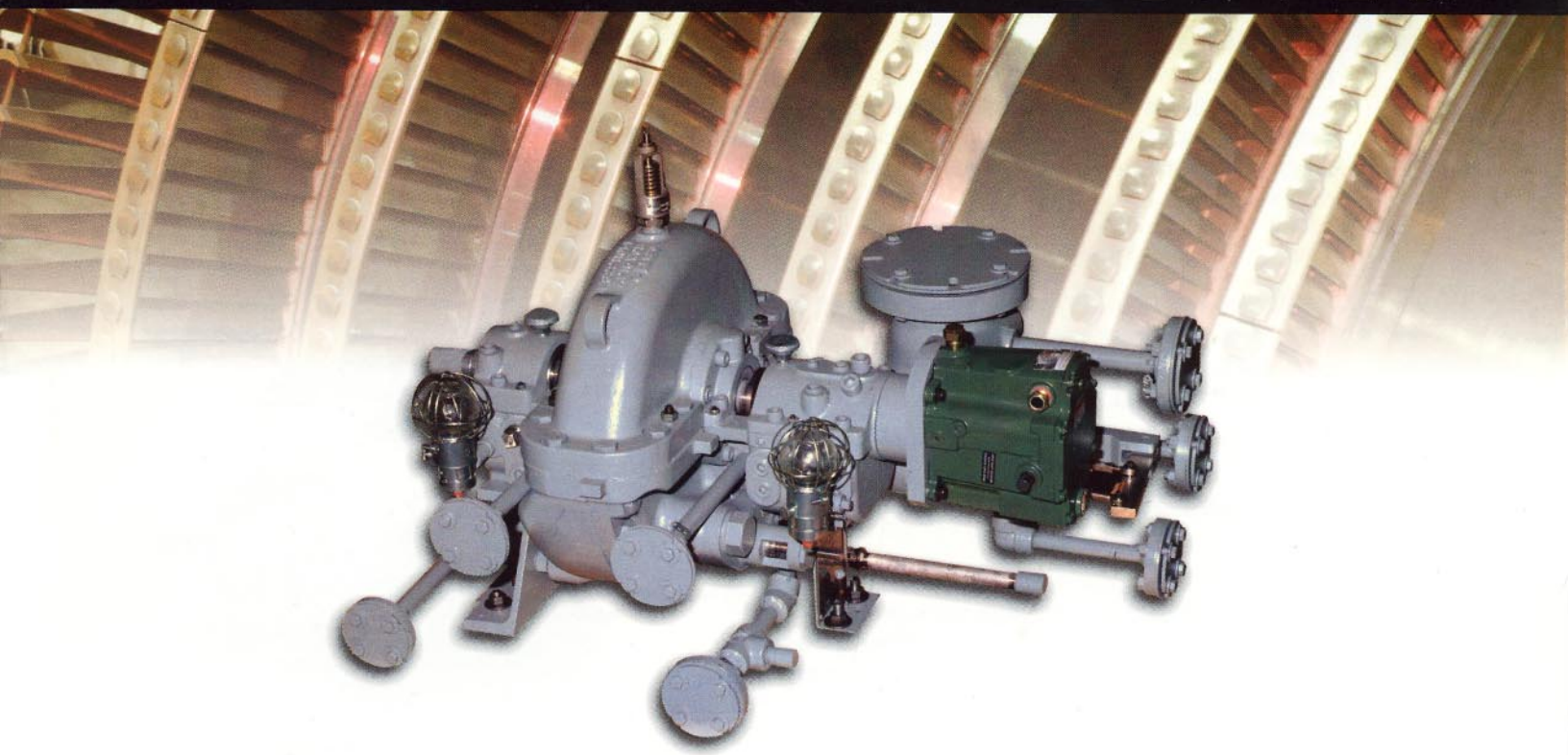
THE POWER TO DELIVER



YR TURBINE PRODUCTS

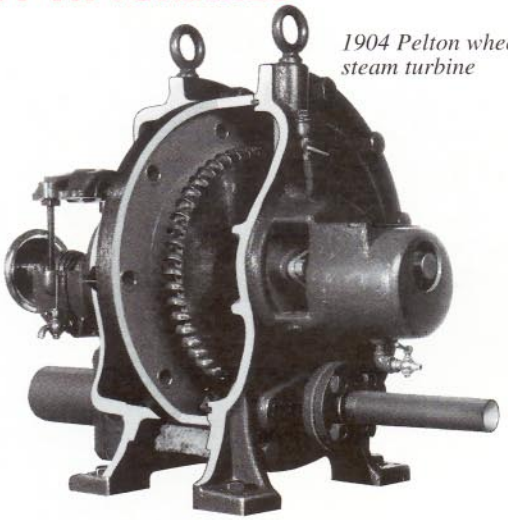
Flexibility to meet all your needs

ELLIOTT®
EBARA GROUP

CHRONOLOGY OF THE DEVELOPMENT OF ELLIOTT YR TURBINES

Continuous Improvement To Meet Customer Needs...

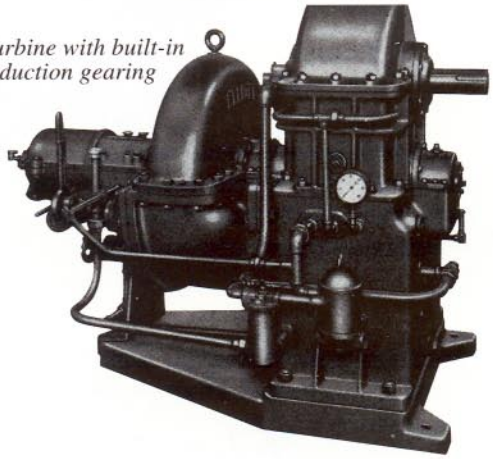
Pre 1940 Elliott acquires Kerr Turbine Company, including its foot-mounted single-stage impulse type mechanical turbine. Elliott introduces its Y-line single-stage turbine featuring centerline support ... over 7,500 were sold. Elliott manufactured gears introduced, including gear integral to turbine shaft.



1904 Pelton wheel steam turbine

1940's YR line (Y-line Revised) introduced with shell bearing liners and ball thrust integrated into design. Improved aero staging, high efficiency milled expanding nozzles, and 900° F designs.

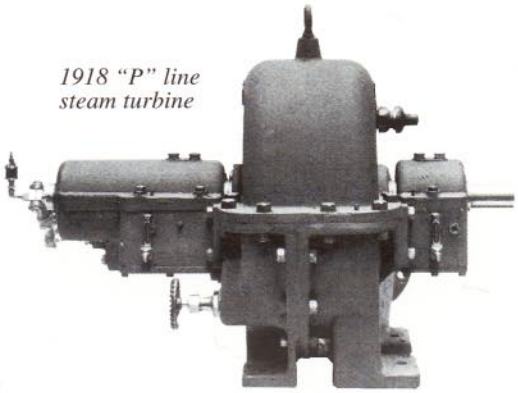
1950's 4EYR Multistage YR introduced, PG governor applied.



Turbine with built-in reduction gearing

1960's BYRHH (375 psig design) high back-pressure introduced. BYRH casings applied for turbine speeds in excess of 10,000 rpm. Elliott-Ebara relationship begins with YR license. Electronic governor applied to YR line.

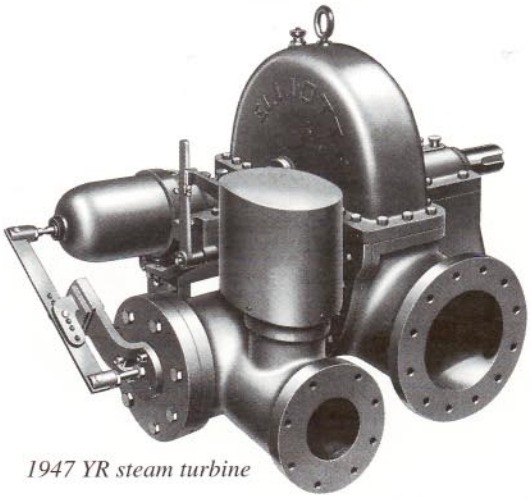
1970's Original V Turbine introduced – 900 psig (Class IV) applications. Double-acting thrust bearing adapted to the YR line. TG governor replaces mechanical governor as standard. Elliott gear designs out-sourced, but retain design advantages for steam turbine applications.



1918 "P" line steam turbine

1980's MYR-line (standardized multistage YR turbine) introduced. EDM nozzle ring design using high efficiency turbocharger aerodynamic staging introduced. 8-inch steam chest introduced on YR line. High back-pressure CYRH line introduced. YR mix product applied for API 612 applications.

1990's Bearing isolators applied to YR and MYR turbine lines High back-pressure DYRH line introduced. Large turbine exhaust ends applied to MYRs. 8-inch steam chest introduced on MYR line. Gas Face seals applied to YR turbines. Higher efficiency, improved strength turbine staging introduced to MYR line. Gas face seals with split housing adapted to YR and MYR turbines. Elliott Digital Governor (EDG) introduced. 10-in. inlet introduced on MYR. Licensed Ebara small turbine PYR line. High-speed 18-inch wheel applied to V turbine.



1947 YR steam turbine

2000's Smaller wheels used on YR product mix for high speeds Elliott proprietary Bearing Isolator (EBI) introduced.

TABLE OF CONTENTS

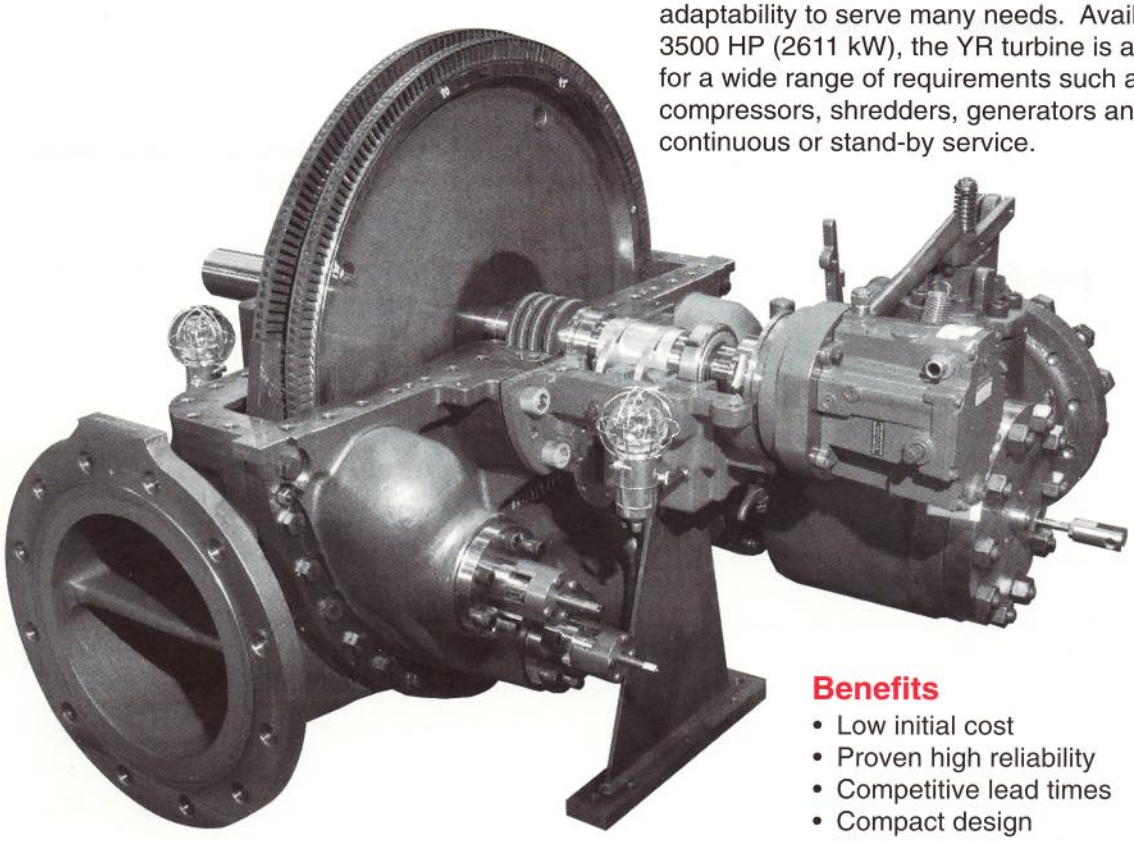
Elliott YR steam turbines are among the most rugged and reliable pieces of precision turbomachinery available anywhere in the world. These masterpieces of Elliott engineering and craftsmanship serve thousands of customers continuously day and night under conditions ranging from humid tropical heat and rainfall to freezing icy tundra and snowfall. Many YRs have been performing for decades. Day after day, year after year.

Because of their flexibility in adapting to customer needs and the available selection of different models, YR turbines are found in a great diversity of applications such as driving pumps, compressors, fans, blowers, generators, sugar mill tandems, cane shredders, paper machine lineshafts and other essential production equipment.

YR turbine products are standardized, and Elliott offers numerous models and accessory options to satisfy the many customer turbine requirements. Because YRs are standardized and major components are stocked, customers can expect prompt shipment to site, avoiding lost production.

THE ELLIOTT YR TURBINE ... after more than 70 years, still the world's preferred standard

Single-valve, single-stage, multi-purpose YR turbines have a worldwide reputation for the highest quality, reliability and adaptability to serve many needs. Available in ratings up to 3500 HP (2611 kW), the YR turbine is a cost-effective answer for a wide range of requirements such as driving pumps, fans, compressors, shredders, generators and other machinery for continuous or stand-by service.



Benefits

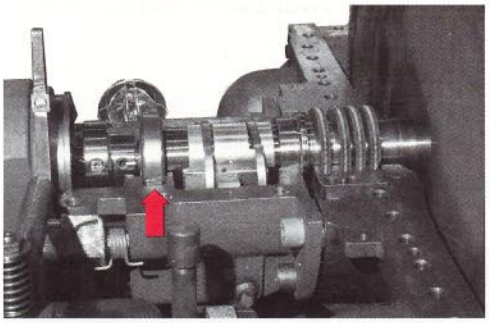
- Low initial cost
- Proven high reliability
- Competitive lead times
- Compact design
- Simple maintenance
- Meets the demanding needs of API 611
- Optional API 612 design
- Highly suitable for continuous or stand-by duty
- Interchangeability of parts

General specifications *(English/Metric)*

Frame	AYR	BYR	CYR & CYRH	DYR & DYRH (DYRM & DYRN)	BYRH (& BYRHH)
Maximum initial pressure (psig/bar)	700/48	700/48	700/48 (1)	700/48 (1)	700/48 (1)
Maximum initial temperature (°F/°C)	750/400	750/400	750/400 (1)	750/400 (1)	750/400 (1)
Maximum exhaust pressure (psig/bar)	vac-100/6.9	vac-100/6.9	vac-100/6.9 (2)	vac-100/6.9 (2)	250/17 (3)
Speed range (rev/min)	1000-7064	1000-6675	100-6950 (4)	1000-5770 (4)	1000-7090 (4)
Wheel pitch diameter (in./mm)	14/360	18/460	22/560	28/710	18/460
Number of stages (impulse type) (5)	1	1	1	1	1
Number of rows of rotating blades	2	2	2	2	2
Inlet sizes (ANSI, in.)	3"	3", 4"	3", 4", 6"	3", 4", 6", 8" (6)	3", 4", 6"
Inlet location (facing governor)	right	right	right	right	right
Exhaust size (ANSI, in.)	6"	8"	10"	12" (7)	8"
Exhaust location (L.H. Standard)	R.H. optional	R.H. optional	R.H. optional	R.H. optional (8)	R.H. optional
Approximate range of capacities (HP/kW)	750/560	to 1400/1050	to 2500/1850	to 3500/2600	to 3000/2250
Approximate shipping weight (lb/kg)	870/400	1275/580	2050/930	2600/1180	2300/1050

(1) Optional 900 psi 900°F
(2) Optional 150 psi
(3) BYRHH: 375 psi/25 bar
(4) Optional higher speeds are available
(5) Rateau staging also available on C, D & BYRH
(6) 450 psig/750°F maximum inlet steam
(7) DYRM: 14 in. maximum exhaust pressure 90 psig
(8) DYRN: 16 in. maximum up exhaust pressure 20 psig

SELF-LOCATING ROTOR

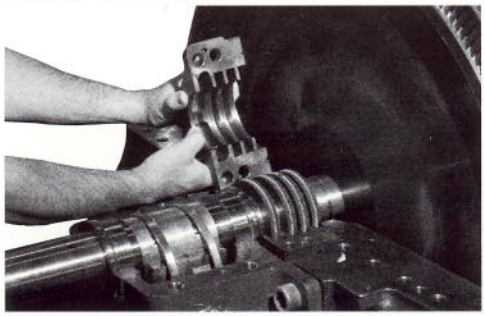


- No fitting
- No clearance adjustment required

The rotor is always in perfect position without adjustment. A large single-row, anti-friction locating bearing (red arrow) fits against a machined shoulder on the turbine shaft and into a groove in the steam end bearing case. Numerically controlled machining of components makes shimming for positioning the rotor unnecessary. The bearing's outer race has an anti-rotation band with a stop that is locked in place by the bearing case cover.

The dynamically balanced rotor has stainless steel blades with stainless steel shroud bands mounted in the high strength alloy steel disks. The latter are shrunk and keyed onto a carbon steel shaft.

SHAFT SEALS



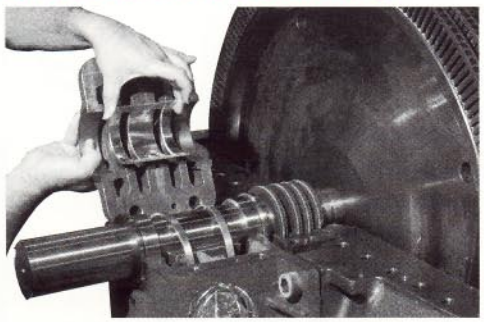
- Easy to inspect
- Easy to replace

The casing seal glands (packing cases) are separate from and bolted to the casing except for the AYR. The carbon sealing rings are thus easily inspected or replaced by a single person; only the upper half of the gland is removed. The heavy casing cover, rotor, and lower half of the gland need not be disturbed.

Non-rusting Inconel springs hold the three segments of each ring firmly in place. Spring stops, locked in position by the cover, prevent the seals from rotating. The rings are sized by computer to assure proper clearance at shaft operating temperature.

In the seal area, the shaft is spray coated with stainless steel to prevent corrosion and wear then ground to a mirror finish.

LINER-TYPE BEARING



- Easy to inspect
- Easy to replace
- Inexpensive

Doweled bearing caps are removed without disturbing other parts – including governor and linkage and are replaced without any adjusting. Bearing liners snap and lock in place no hand-scraping or fitting is required. To promote rapid heat transfer, bearings have a thin-wall steel shell with a bonded babbitt surface. A water jacket removes heat from the lubricating oil, and combined with air spaces at the bolting surfaces, insulates the oil from casing heat.

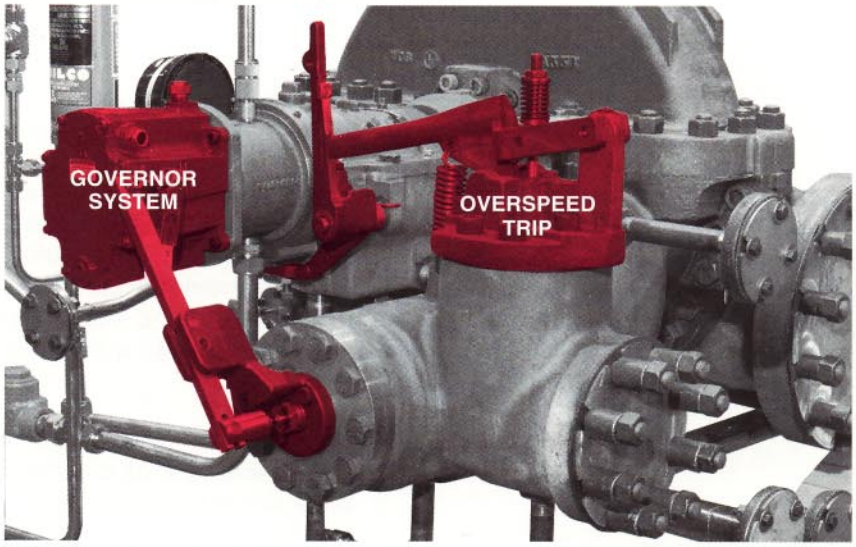
Bearing cases are sealed by rotating "air-turbulence" labyrinth seals that have both internal and external slingers. Lubrication is by oil rings and oil is supplied by a constant-level oiler.

Plugged openings are furnished for inspection of oil ring rotation, and for draining the water jacket and oil reservoir.

MECHANICAL-HYDRAULIC GOVERNING SYSTEM ..separate overspeed trip and valve

This governor system is suitable for most turbine-driven pumps, fans, compressors, small generators applications, etc. Other systems with NEMA D performance are available.

Motion of the flyweights causes the pilot valve plunger to change the power piston oil pressure, producing movement of the terminal shaft, which is connected to the balanced, double-seated valve through linkage and a single lever. The valve stem and guide bushings are hardened to assure long life and ease of maintenance. The valve stem is sealed with adjustable graphite-impregnated packing, having an easily accessible nut in the steam chest cover. The rabbet fit of the cover assures proper alignment for operation and reassembly.



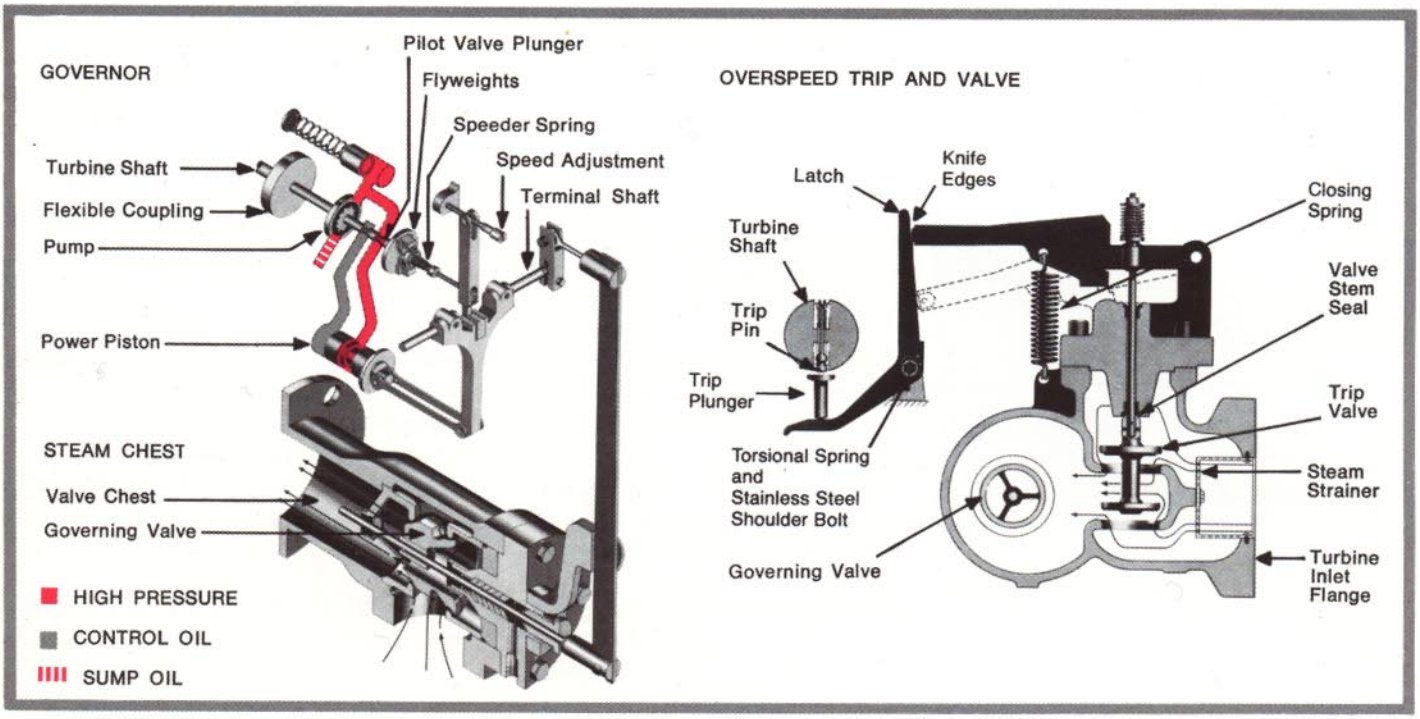
Type T sealed, mechanical-hydraulic oil relay governor (NEMA Class A). Steady state speed regulation - 10% maximum. Trip speed setting 15% above maximum governor speed. Manual speed-changer included.

Overspeed trip and valve

A spring-opposed pin in the turbine shaft is forced or driven outward by excessive speed and contacts a non-sparking aluminum silicon bronze-tipped trip plunger. Plunger movement rotates the latch to disengage the knife edges. The double-seated trip valve is snapped shut by a closing spring. A torsion spring normally keeps the knife edges engaged. (A single-seated valve with inner pilot valve is used in the AYR steam chest.)

The trip valve can be reset against full line pressure. The entire trip mechanism can be inspected without taking the turbine out of service or without interrupting the process.

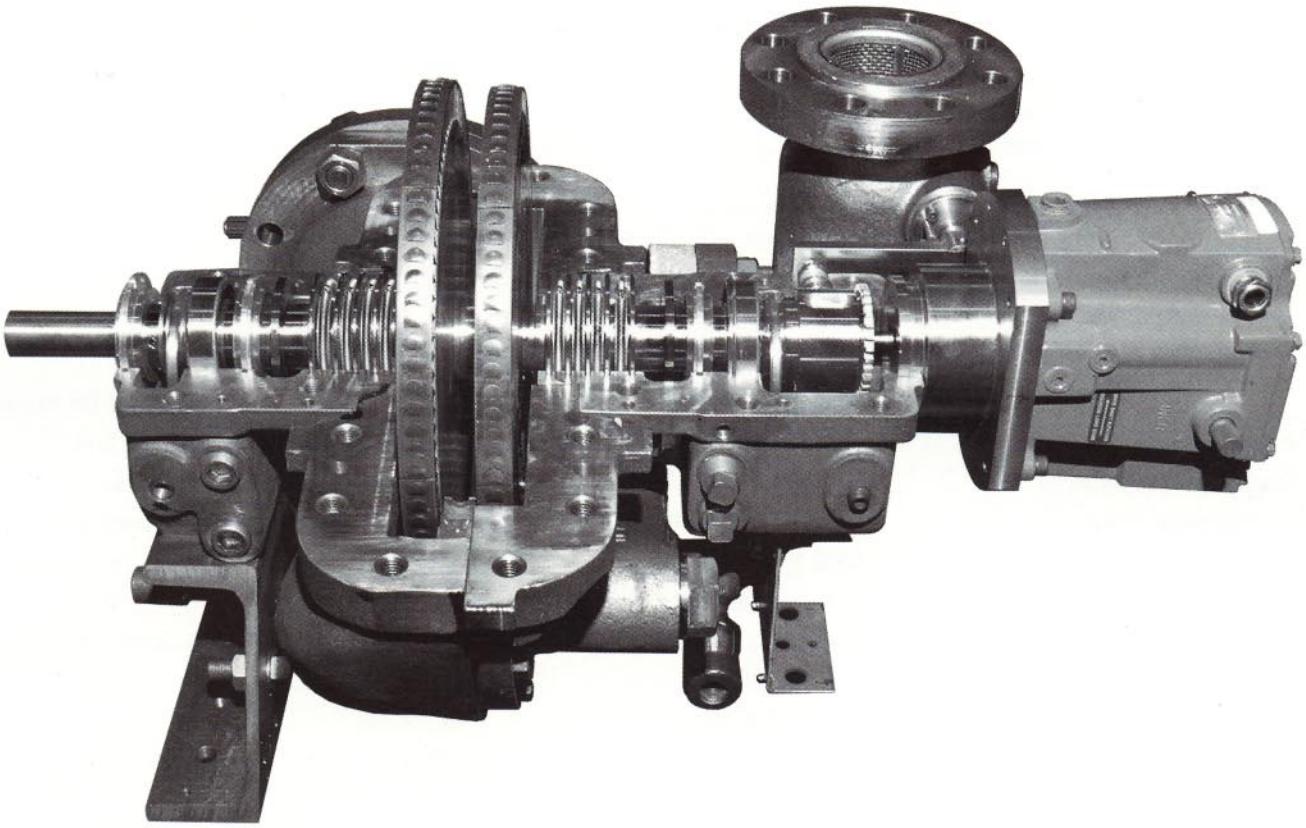
The trip setting is quickly adjustable without lifting the bearing case cap or disturbing the linkage. The valve stem and guide bushings are corrorsion resistant for long life and ease of maintenance. When the turbine is operating the valve is backseated with the lower guide bushing. The rabbet fit of the cover assures alignment for operation and reassembly.



Slightly smaller than the other YR turbines, the PYR model is superbly engineered and crafted to deliver traditional YR reliability for lower power applications. This single-stage horizontally split steam turbine is dependable, economical and flexible, and can be used in driving fans, pumps, compressors and other industrial equipment. Utilizing antifriction type journal bearings, the PYR accomodates ring-oiled lubrication for turbine inlet temperatures to 750 Deg. F. and is ideally suited for stand-by duties.

Benefits

- Low initial cost
- Proven high reliability
- Competitive lead times
- Compact design
- Simple maintenance
- Meets the demanding needs of API 611

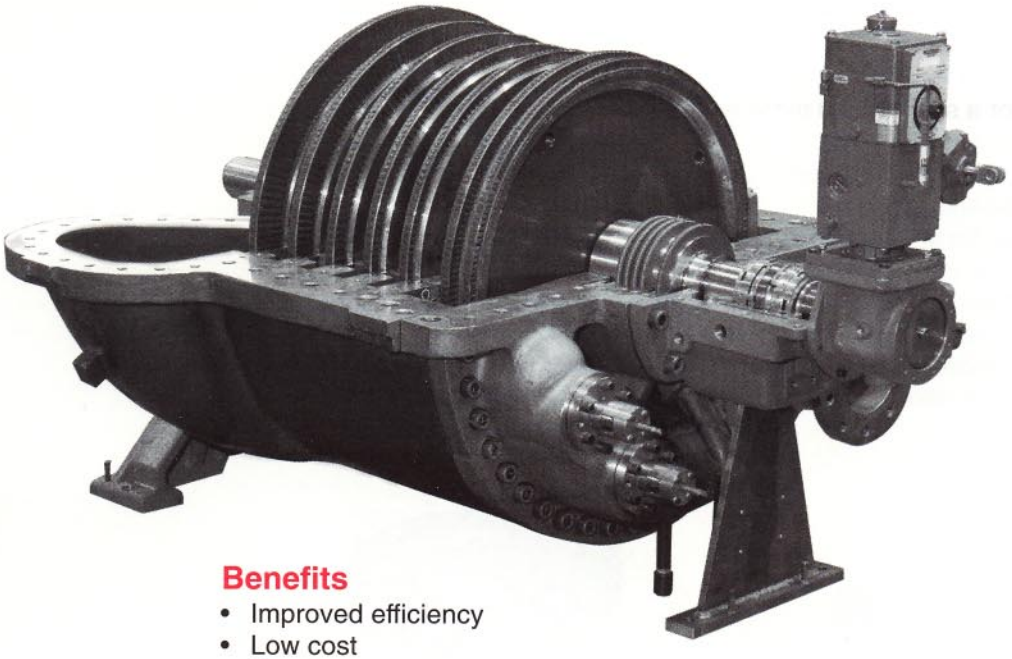


General ˂ cations *(English/Metric)*

Inlet Pres ɣ/bar)	650/45
Inlet Tr .e (°F/°C)	752/400
Exh ɜsure (psig/bar)	100/6.9
.ch Diameter (in./mm)	12/305
	5000 rpm
wer (HP/kW)	200/150

Number of Stages	1
Inlet Sizes (ANSI, in.)	3
Inlet Rating	600 lb/R.F.
Exhaust Sizes (ANSI, in.)	6
Exhaust Rating	150 lb/R.F.
Approximate Shipping Weight (lb/kg)	550/250

ELLIOTT MULTI YR TURBINE ... produce more power without additional steam consumption



For improved steam consumption, Elliott engineers designed the Multi-YR Turbine product line. This design combines the reliability and parts interchangeability of our popular single-stage YR turbine with the power and efficiency of our traditional multistage turbines. The Multi-YR produces more horsepower without additional steam. Designed to take a minimum of space, The Multi-YR can be mounted in many areas where single stage turbines are currently operating, without costly foundation changes and other major modifications. Multi-YR turbines are available up to 10,000 hp (7500 kW).

Benefits

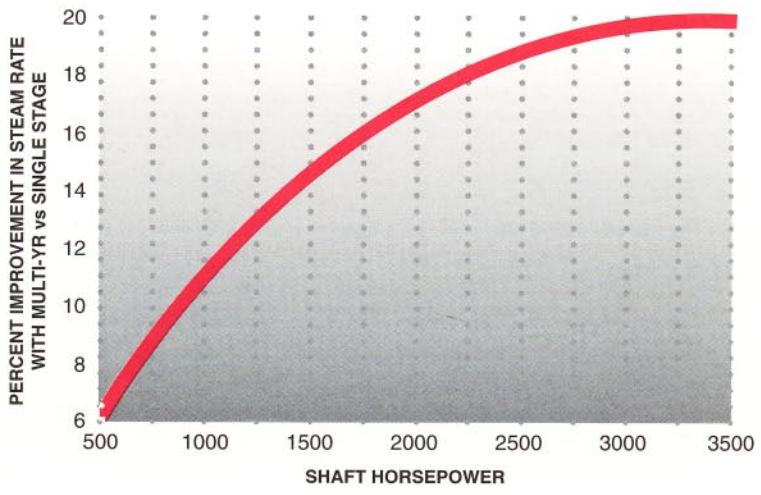
- Improved efficiency
- Low cost
- Standardized parts
- Flexibility to meet customer needs
- Meets the demanding standards of API 611 and API 612

General specifications *(English/Metric)*

	4 Stage (or more)	6 Stage	8 Stage (or more)
Inlet Pressure (psig/bar)	to 900/62	to 900/62	to 900/62
Inlet Temperature (°F/°C)	to 900/482	to 900/482	to 900/482
Exhaust Pressure (psig/bar)	Condensing to 100/6.9	Condensing to 100/6.9	Condensing
Wheel Pitch Diameter (in./mm)	12 to 28/304 to 710	18 to 28/457 to 710	18 to 28/457 to 710
Speeds	1500 to 17000	8500	7000
Number of Stages (Varies with duty)	1 Curtis 3 Rateau	1 Curtis 5 Rateau	1 Curtis 7-8 Rateau
Inlet Sizes (ANSI, in.)	4, 6, 8, 10	4, 6, 8, 10	4, 6, 8, 10
Exhaust Sizes (ANSI, in.)	14, 24, 30	14, 24, 30	30, 36, 42
Power (hp/kW)	to 5000/3730	to 7000/5222	to 10000/7500
Approximate Shipping Weight (lb/kg)	to 9500/4310	to 10000/4535	to 17000/7710

Typical steam rate improvement

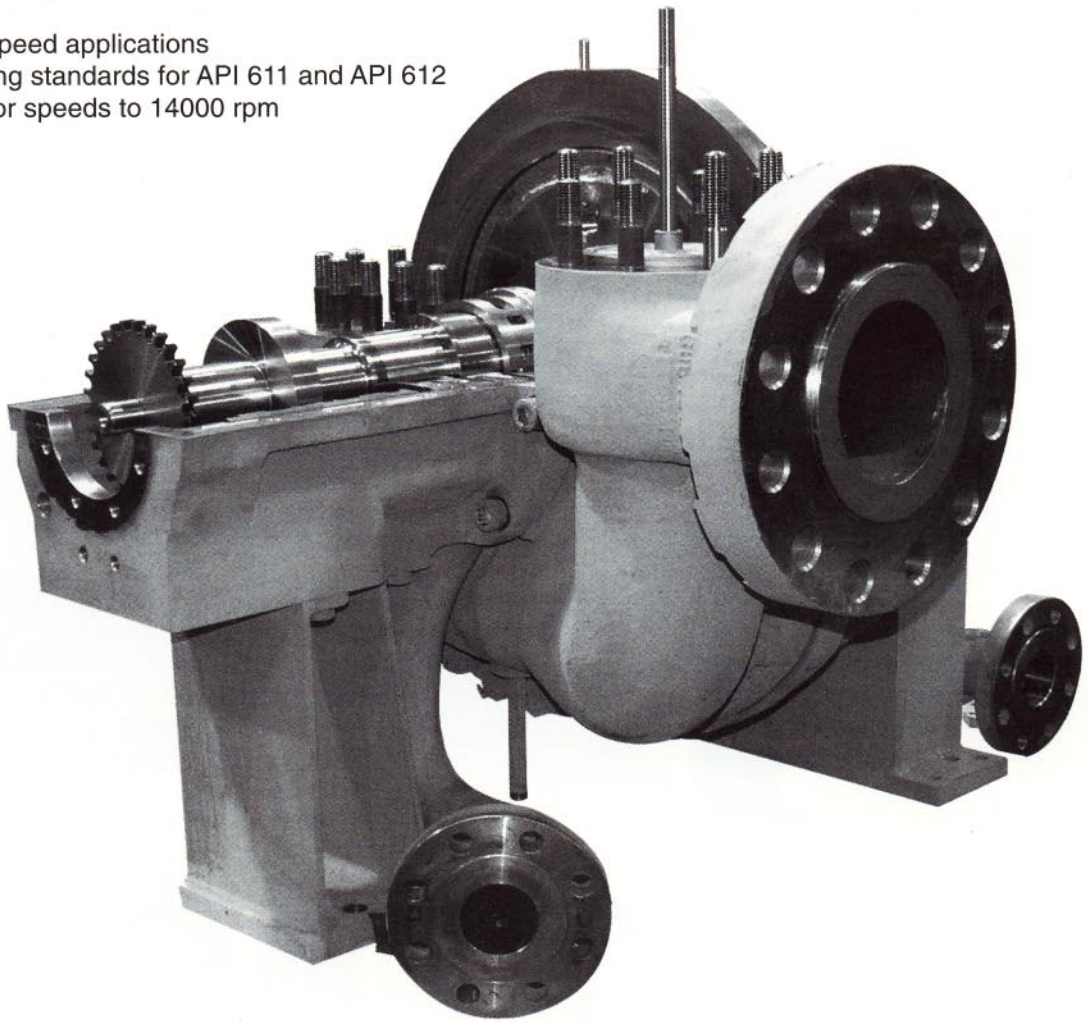
Multi-YR versus single stage turbine
600 psig, 750° F, 75 psig
(41.4 bar, 400° C, 5.2 bar)
3600 r/min



While retaining the reliability and economy of the standard YR turbines, Elliott specialists created the V Turbine line in response to customer demand for a simpler and more economical means of operating high-speed equipment.

Benefits

- Skillfully engineered – over 30 years' field experience
- Low initial cost
- High operating efficiency
- Compact design
- Designed for high-speed applications
- Meets the demanding standards for API 611 and API 612
- Stiff shaft designs for speeds to 14000 rpm



General specifications

Maximum Initial Pressure (psig/bar)	900/62
Maximum Initial Temperature (°F/°C)	900/482
Exhaust Pressure (psig/bar)	100/6.9 to 350/24
Speed Range, rpm	to 20000
Number of Stages	to 4
Number of Hand Valves	to 2
Inlet sizes (ANSI)	4", 6"
Exhaust Sizes (ANSI)	10" to 14"
Approximate Range of Capacities (HP/kW)	to 4000/2985

FEATURES & FLEXIBILITY

Common

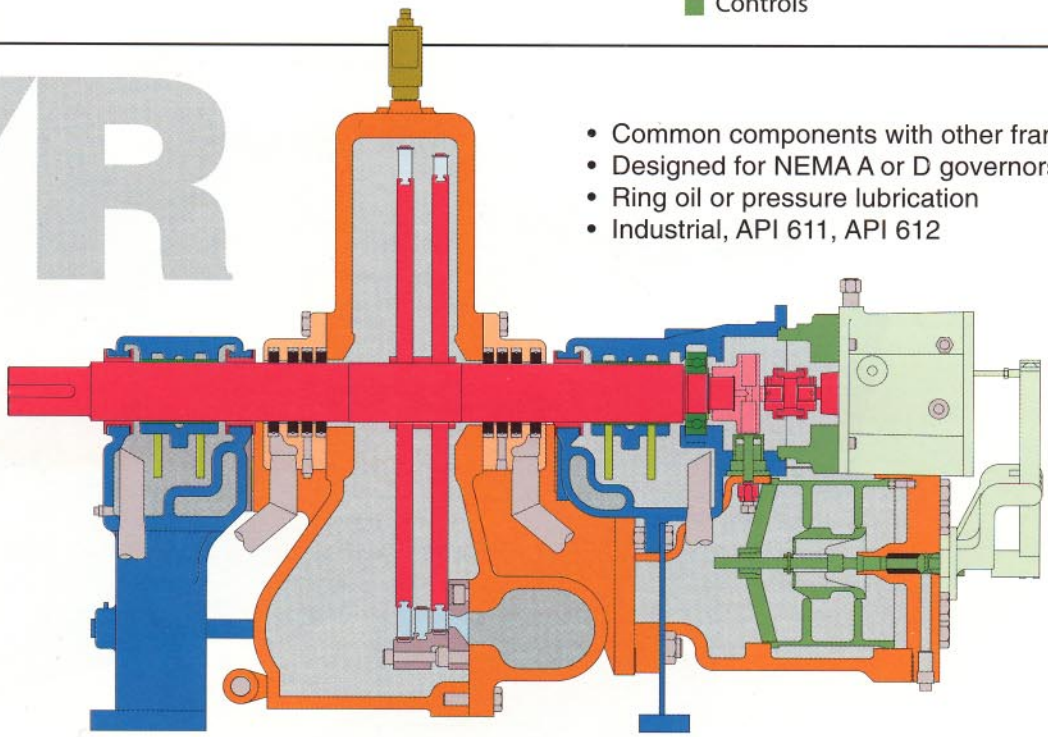
- Parts interchangeability between frame sizes. Horizontally split casings for ease of maintenance
- Metal to metal casing joints that can be resealed without rigid gasket
- True centerline support assures alignment cold or hot
- Dynamically balanced rotor
- Liner type journal bearing snap into place without scraping or fitting (ball bearing on PYR's)
- Steam chest can be fully insulated to protect personnel
- Separate steam seal covers so you an replace seals without lifting and re-sealing main casing (except AYR, PYR)
- Bearing case seals with inner and outer slingers to keep contaminants out, oil in.
- Water jacketed bearing housings can be drained without installing valve (N/A on V products)
- Separate force-actuated positive closing overspeed trip
- Labyrinth or carbon ring steam seals
- Electronic governors
- Electronic trip

Optional

- API 612 on C, D, BH, HH, V, J,K, MYR turbines
- Solid rotor construction
- Tilt pad thrust bearings and journal bearings
- Integral coupling hub (API 612 units)
- Integral thrust disk (API 612 units)
- At-speed balance (on V turbines)

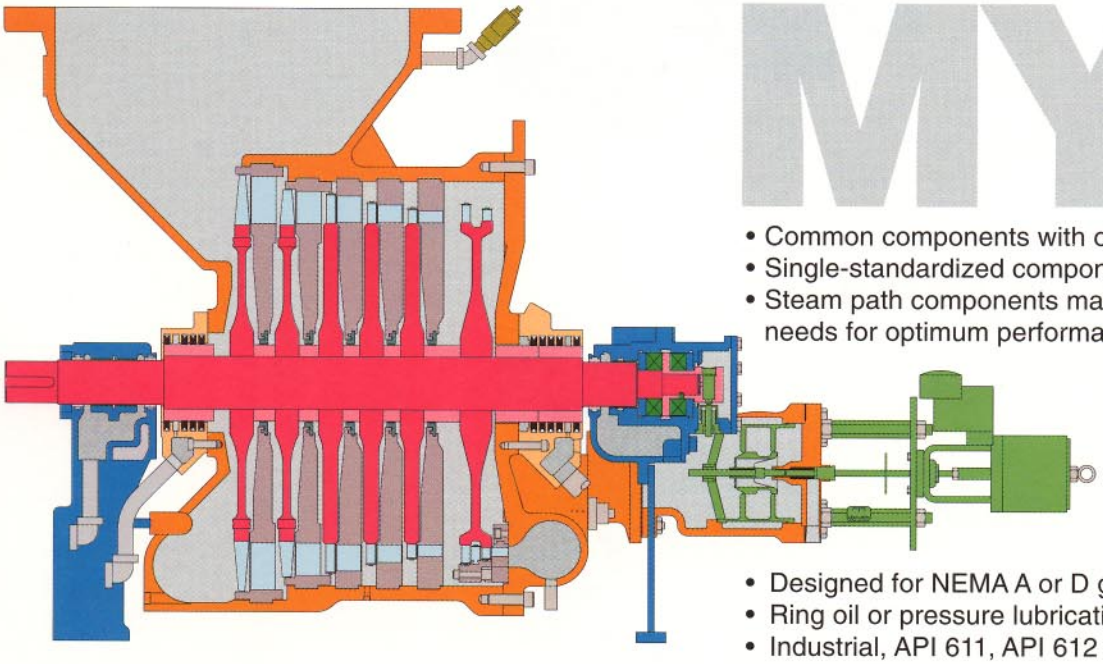
- Hardware
- Rotor Assembly
- Casings
- Bearing Housing
- Bearings
- Oil Rings
- Controls
- Packing Cases
- Carbon Rings
- Nozzle Rings
- Sentinel Valve
- Nozzle/Blade
- Stationary Seal

YR



- Common components with other frame sizes
- Designed for NEMA A or D governors
- Ring oil or pressure lubrication
- Industrial, API 611, API 612

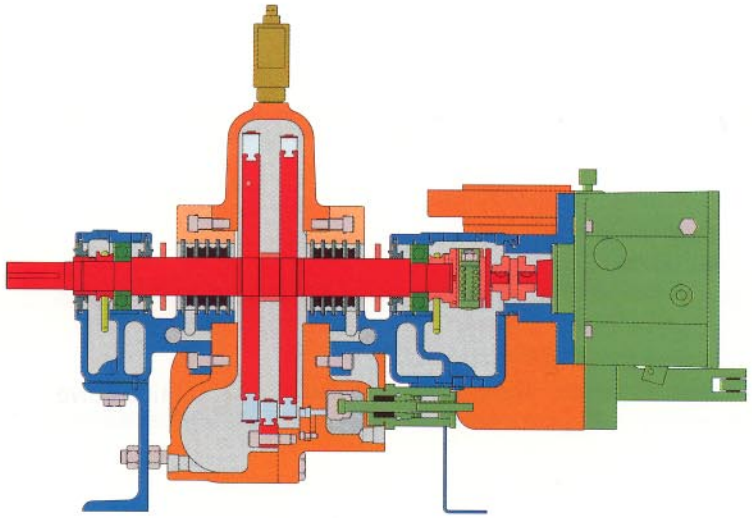
MYR

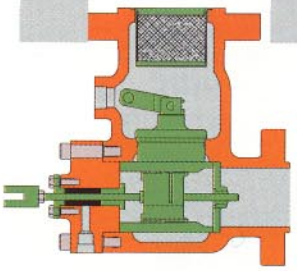


- Common components with other frame sizes
- Single-standardized component design
- Steam path components matched to the customer's needs for optimum performance and price

- Designed for NEMA A or D governors
- Ring oil or pressure lubrication
- Industrial, API 611, API 612

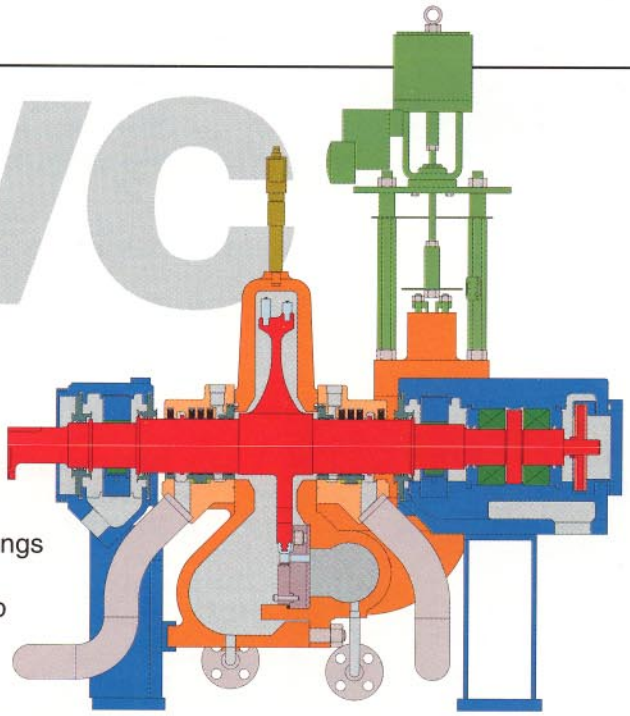
PYR





- Designed to be a direct pump driver
- Ring oil lubrication to 750°F (400°C) inlet steam temperature

VB-VC

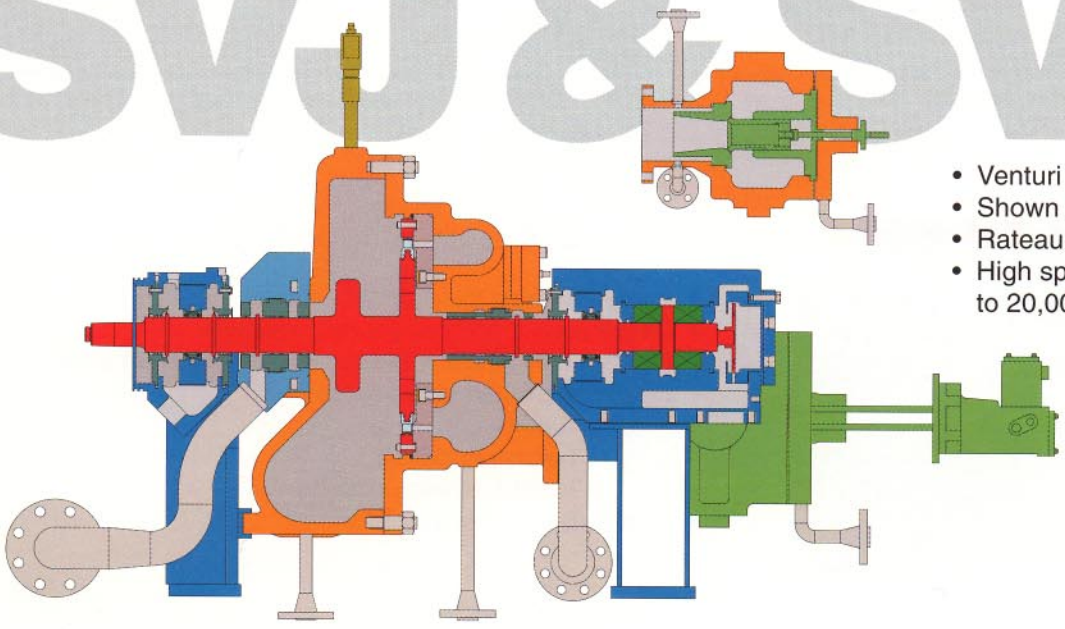


- Venturi governor valve
- Shown as typical API 611 top half and API 612 bottom half

API 611
- Built up rotor
- Sleeve journal bearings
- Carbon ring steam seals
- Keyed shaft
- NEMA D governor
- Curtis stage

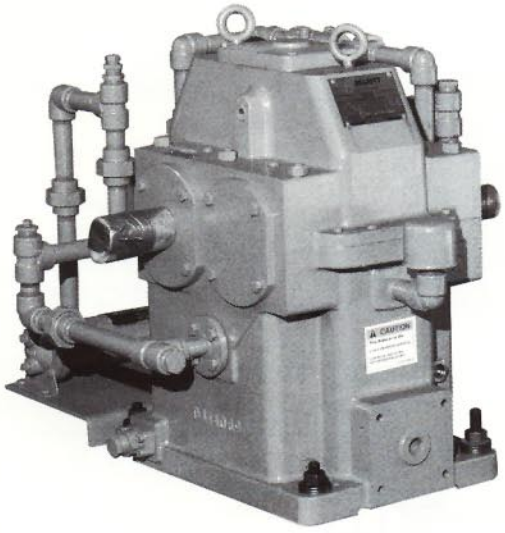
API 612
- Solid rotor
- Tilt pad journal bearings
- Laby steam seals
- Integral coupling hub
- NEMA D governor
- Rateau stage

SVJ & SVK



- Venturi governor valve
- Shown as typical API 612
- Rateau stage up to 4 stages
- High speed applications to 20,000 RPM

ELLIOTT DESIGNED OPTIONS & ACCESSORIES



Elliott gear benefits and features

- Proven high reliability - manufactured since 1912
- Backed by worldwide service
- Easy maintenance/inspection
- Economic/quiet operation
- Custom ratios
- Large oil tank in gear case - no need for separate oil tank for most applications
- Eight frame sizes to match turbine frames
- Single source gear - turbine responsibility
- Horizontally-split gear case can be opened without disturbing piping on connections
- Gears and pinions are hobbed and finish ground
- Pinion is solid single forging
- Gear can be designed to API 677 or API 613
- Gears are rated to AGMA 6011
- Gear cases are poured high tensile, heavy section cast iron
- Thin walled liner bearings

Electronic Digital Governor

- Improved speed control and reliability over hydraulic governors
- No need for easily misplaced, separate programmer
- Sized for 19" rack mounting
- Low initial cost
- MPU okay indication
- Remote speed control capability 4-20 mA DC, 300 ohms
- Fail safe
- Programmable idle speed, ramp rate, turbine speed, electronic trip speed

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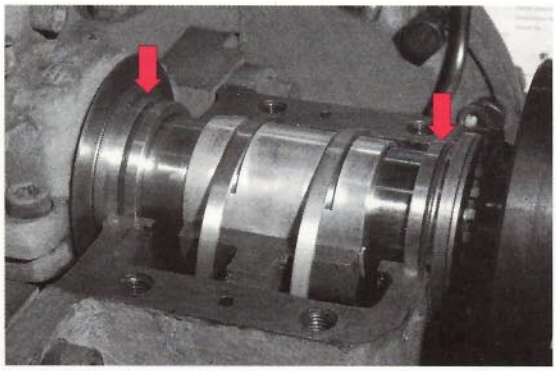
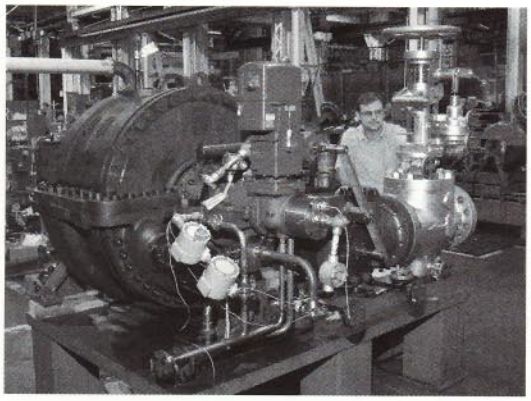


Elliott Bearing Housing Isolators

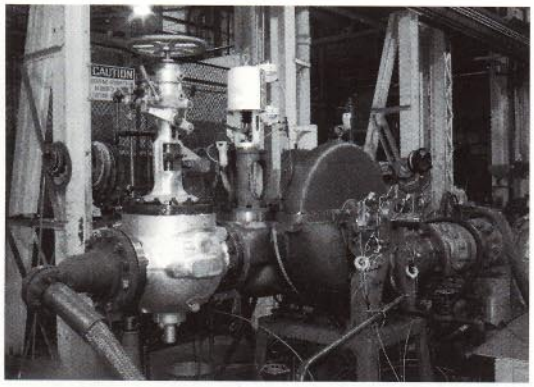
- Longer bearing life
- Single source component responsibility
- Designed by a steam turbine manufacturer for steam turbine applications to address
  - Turbine growth
  - Turbine materials
  - Turbine bearing options
- Installed and tested by Elliott

ELLIOTT HAS THE FLEXIBILITY TO MEET YOUR SPECIAL NEEDS



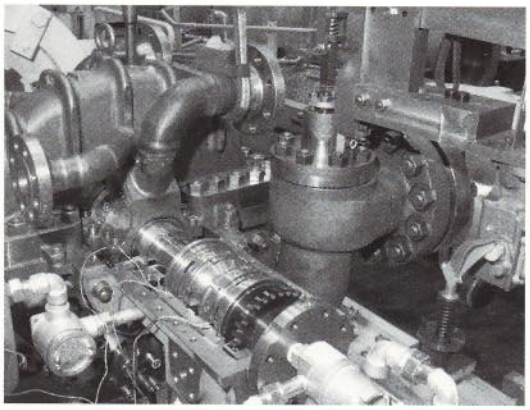
Multi-stage with trip and throttle valve and API options

- Multi-stage turbine for API 611 applications, and fully instrumented with separate trip and throttle valve
- Woodward NEMA D governor
- API flanged and welded drains
- RTD's
- Vibration probes
- Hand valves



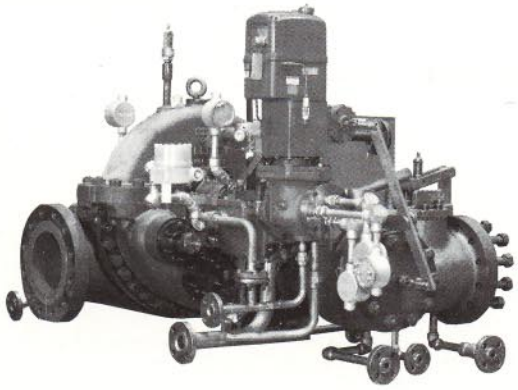
Single stage with trip and throttle valve

- YR turbine with separate trip and throttle valve and electronic governor with pneumatic governor valve actuator



Bearings and steam seals

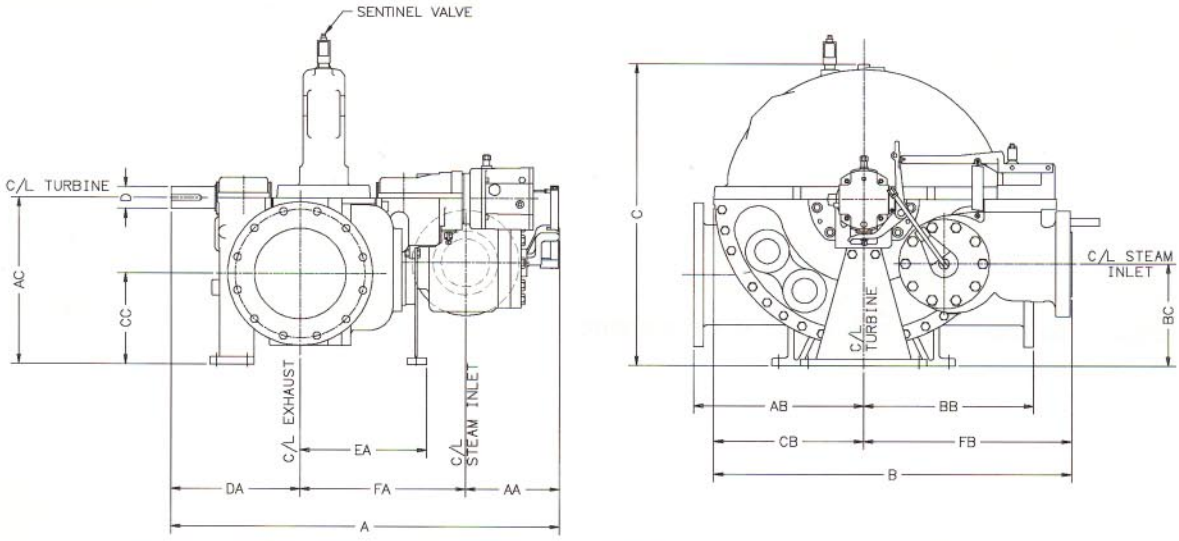
- Tilt pad thrust for higher thrust loads
- Doweled bearing housings, packing cases and casing
- Tilt pad journal bearing
- RTD's
- API 612 design
  - Labyrinth packing
  - Steel bearing housing
  - Electronic trip



Single stage with API options

- API instrumentation for severe duty application
  - RTD's
  - Vibration probes
  - Key phasor
  - API flanged and welded draining
- PG governor
- Hand valves

Approximate dimensions for YR *(Inches, Millimeters)*



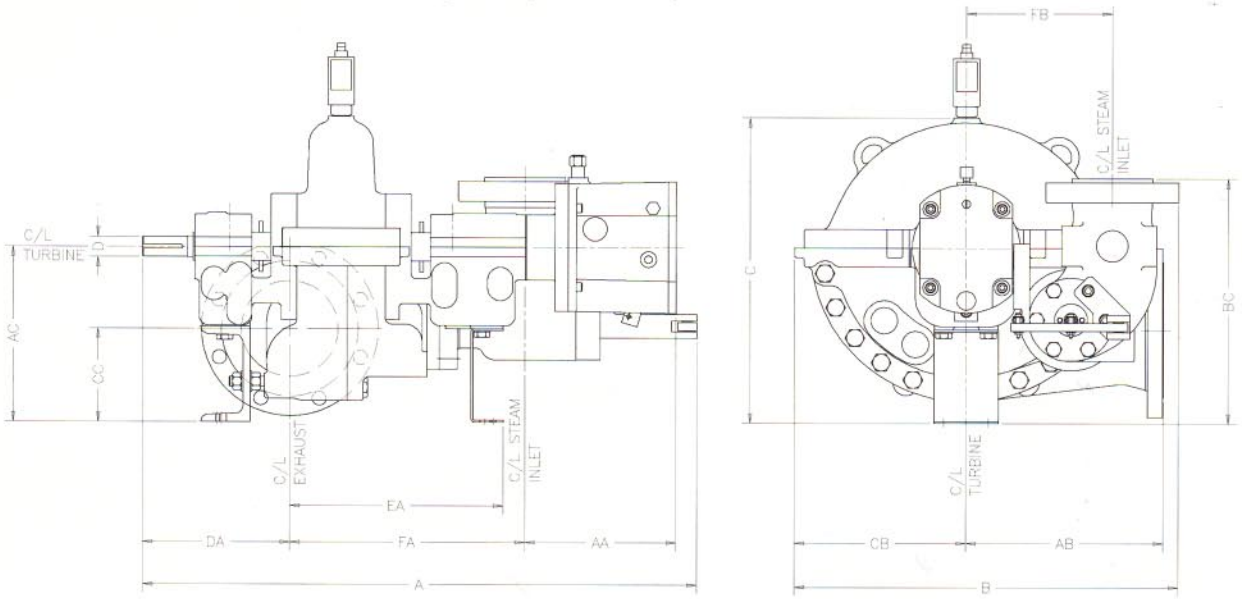
	A	AA	FA	DA	EA	B(1)	AB	BB	CB	FB(1)	C	AC	BC	CC	D	APPROX. NET WEIGHTS (TURBINE ONLY) LB/KG
AYR	40.74 1035	12.00 305	15.74 400	12.82 325	15.18 386	31.12 791	13.74 349	13.74 349	12.62 321	18.50 470	24.00 610	12.00 305	5.00 127	6.50 165	1.9325 49.09	800 365
BYR	45.88 1165	12.26 311	21.18 538	12.44 316	17.30 440	36.12 918	16.00 406	16.00 406	13.62 346	22.50 572	28.00 711	14.00 356	7.74 197	7.00 178	1.9325 49.09	1075 488
CYR	51.24 1301	12.26 311	21.18 538	17.82 452	16.06 408	40.12 1019	19.24 489	19.24 489	16.62 422	23.50 597	34.74 883	17.00 432	8.50 216	8.50 216	2.4325 61.78	2050 930
DYR (3)	50.88 1292	12.26 311	21.68 551	16.94 430	16.56 421	43.12 1096	22.24 565	22.24 565	19.62 499	23.50 597	42.50 1080	22.00 559	13.50 343	12.00 305	2.9325 74.48	2300 1045
DYRM	50.88 1292	12.26 311	22.68 576	15.94 405	17.56 446	43.12 1096	23.00 584	23.00 584	19.62 499	23.50 597	42.50 1080	22.00 559	13.50 343	11.24 286	2.9325 74.48	2300 1045
BYRH, BYRHH	55.38 1407	12.26 311	27.00 686	16.12 410	21.88 556	39.88 1013	18.74 476	18.74 476	16.38 416	23.50 597	31.12 791	17.00 432	8.50 216	9.00 229	2.4325 61.78	2050 930

(1) AYR, BYR 3" INLET. 4" FOR ALL OTHER FRAMES.

(2) DIMENSIONS FOR 8" INLET AND DYRN NOT SHOWN.

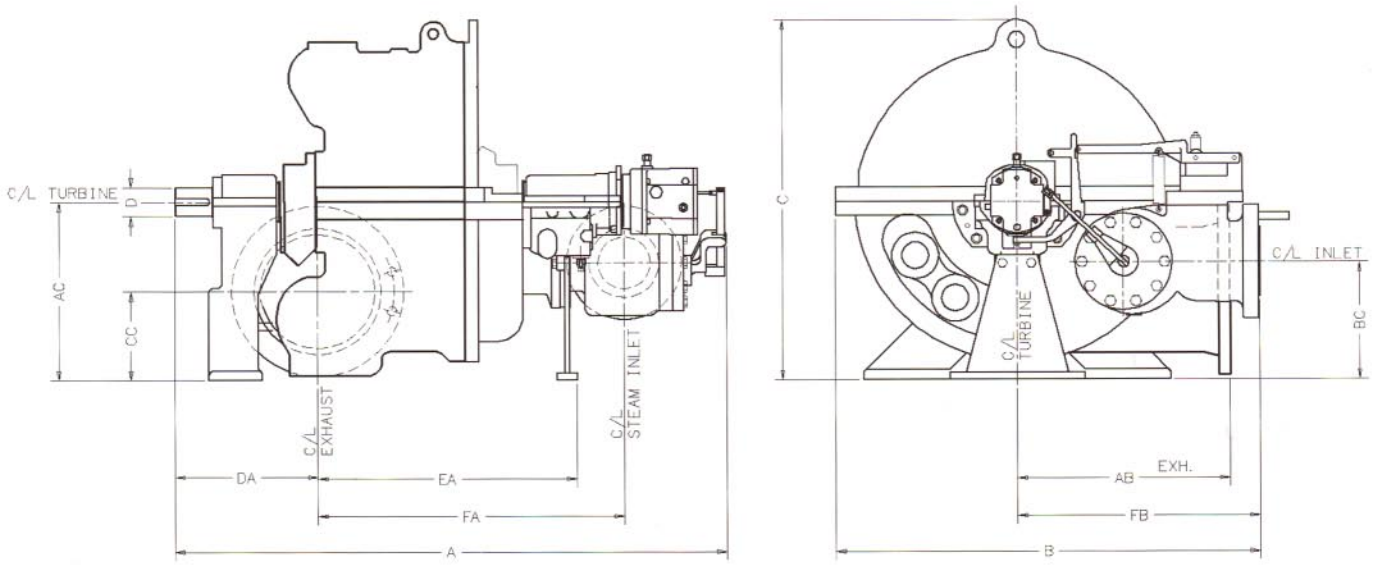
(3) LEFT HAND EXHAUST (AB DIMENSION) IS STANDARD. EXCEPT UP EXHAUST ON DYRN.

Approximate dimensions for PYR *(Inches, Millimeters)*

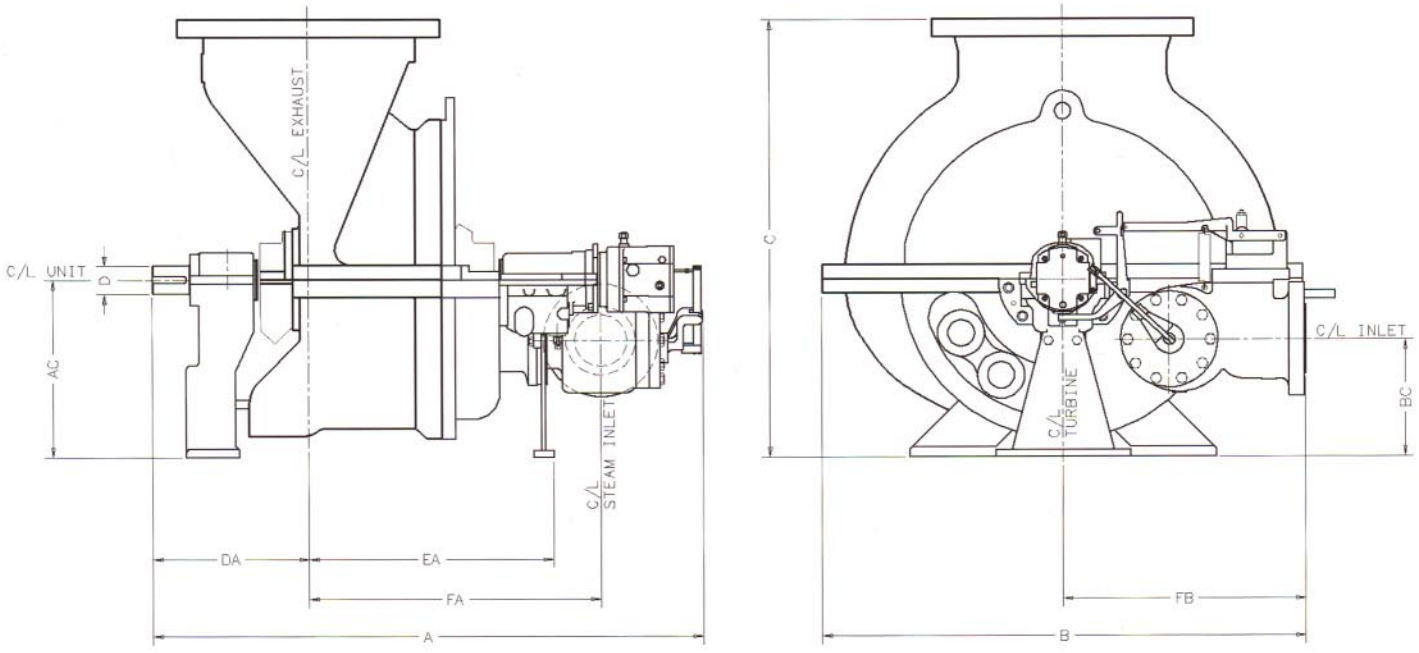


	A	AA	FA	DA	EA	B	AB	CB	FB	C	AC	BC	CC	D	APPROX. NET WEIGHTS LB/KG
PYR	34.36 873	9.37 238	14.57 370	9.15 232	13.22 336	23.82 605	12.25 311	10.63 270	9.06 230	19.19 487	11.00 279	15.38 391	5.88 149	1.2500 31.75	550 250

Approximate dimensions for MYR up to 6 stages *(Inches, Millimeters)*

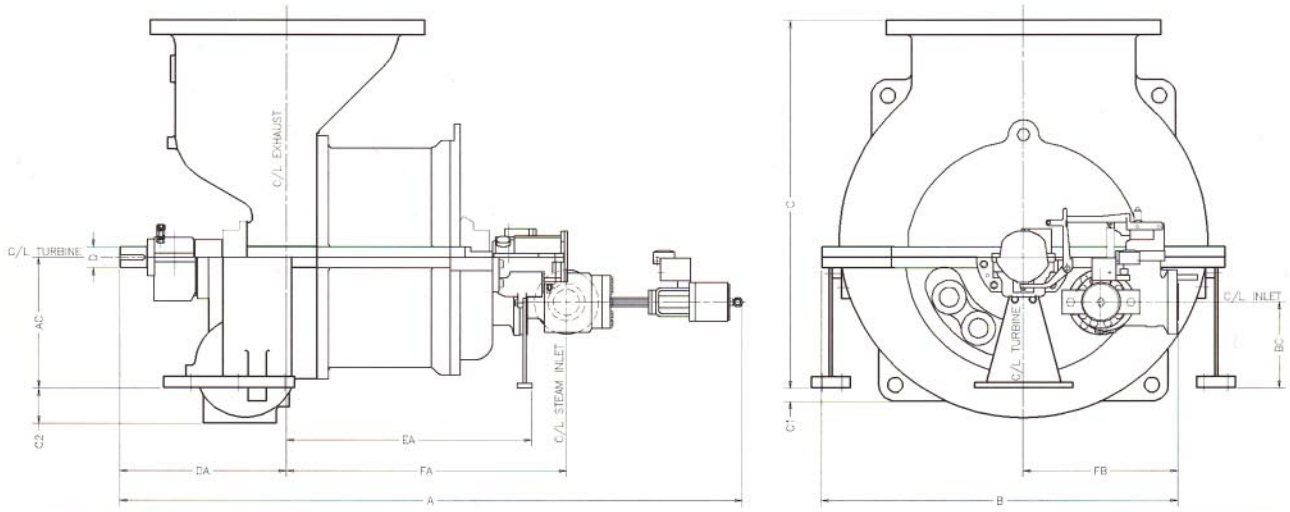


	A	FA	DA	EA	B	AB	FB	C	AC	BC	CC	D	APPROX. NET WEIGHTS LB/KG
2DYRT3 14" SIDE EXHAUST 6" INLET	67. 25 1708	37. 34 948	17. 44 443	31. 59 802	51. 86 1317	26. 00 660	29. 74 755	44. 50 1130	22. 00 559	14. 50 368	11. 00 279	3. 5041 89. 004	7, 200 3266
2DYRT5 14" SIDE EXHAUST 6" INLET	74. 00 1880	44. 21 1123	17. 44 443	38. 46 977	51. 86 1317	26. 00 660	29. 74 755	44. 50 1130	22. 00 559	14. 50 368	11. 00 279	3. 5041 89. 004	7, 800 3538

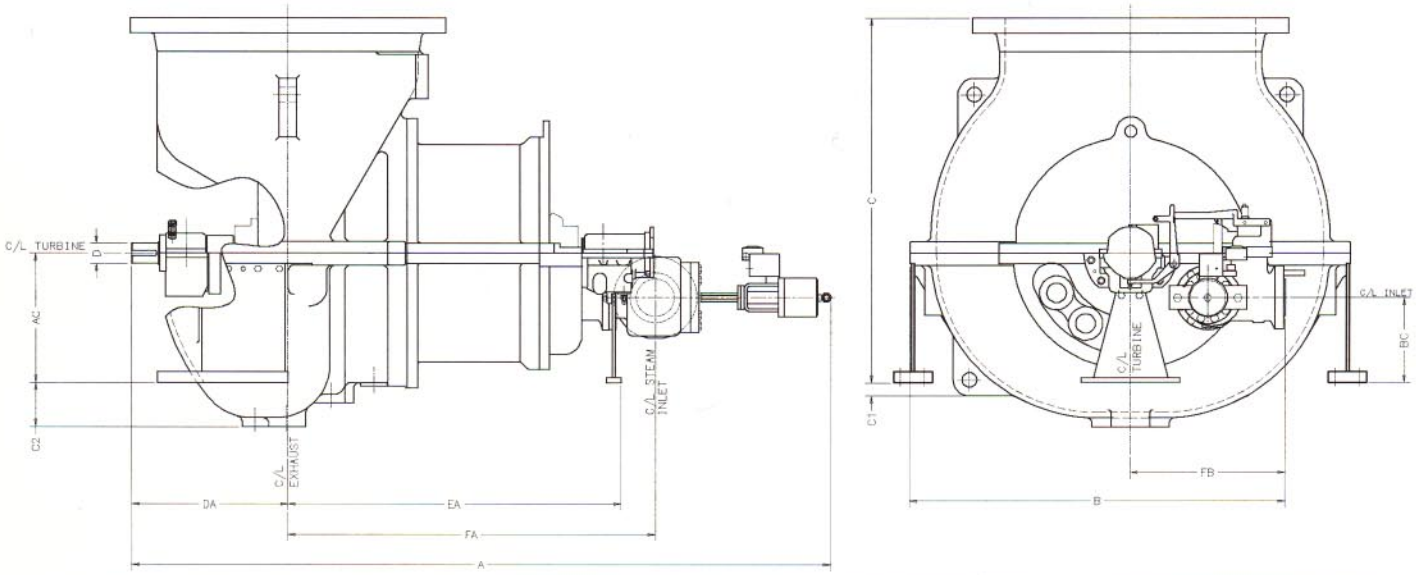


	A	FA	DA	EA	B	AB	FB	C	AC	BC	CC	D	APPROX. NET WEIGHTS LB/KG
2DYRT3 24" UP EXHAUST 6" INLET	67. 25 1708	35. 62 905	19. 16 487	29. 87 759	59. 12 1502	N/A	29. 74 755	54. 00 1372	22. 00 559	14. 50 368	N/A	3. 5041 89. 004	8, 700 3946
2DYRT5 24" UP EXHAUST 6" INLET	74. 06 1881	42. 50 1080	19. 16 487	36. 75 933	59. 12 1502	N/A	29. 74 755	54. 00 1372	22. 00 559	14. 50 368	N/A	3. 5041 89. 004	9, 300 4218

Approximate dimensions for MYR greater than 6 stages *(Inches, Millimeters)*

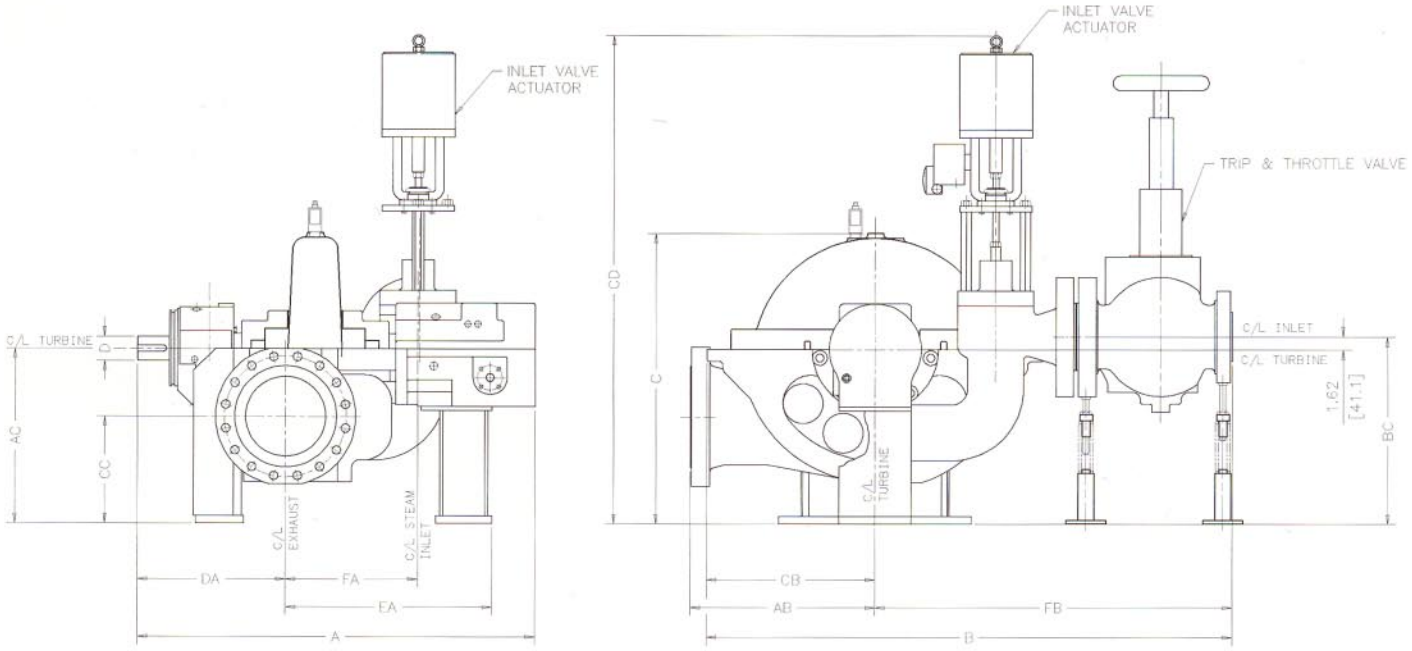


	A	FA	DA	EA	B	FB	C	C1	C2	AC	BC	D	APPROX. NET WEIGHTS LB/KG
2DYRPE7 36" UP EXHAUST	104. 25 2648	46. 90 1191	28. 02 712	41. 09 1044	63. 50 1613	29. 75 756	62. 00 1575	2. 25 57	6. 00 152	22. 00 559	14. 50 368	3. 5041 89. 004	12, 000 5, 443

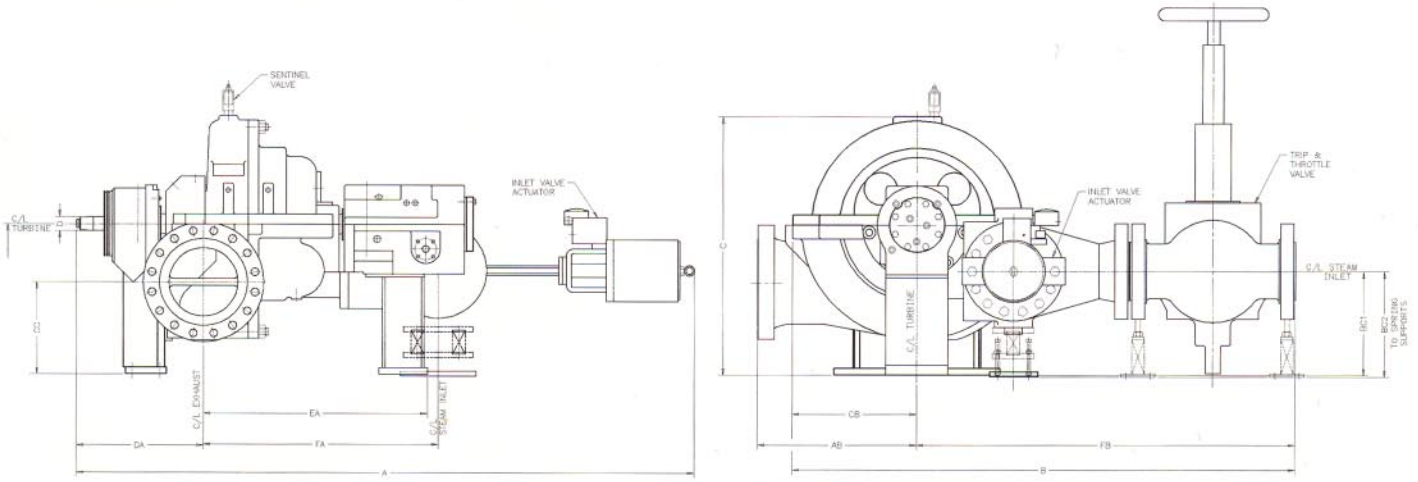


	A	FA	DA	EA	B	FB	C	C1	C2	AC	BC	D	APPROX. NET WEIGHTS LB/KG
2DYRPE8 42" UP EXHAUST	117. 32 2980	61. 90 1572	26. 29 668	55. 90 1420	66. 75 1695	29. 75 756	62. 00 1575	2. 25 57	7. 50 191	22. 00 559	14. 50 368	3. 5041 89. 004	16000 7258

Approximate dimensions for V *(Inches, Millimeters)*



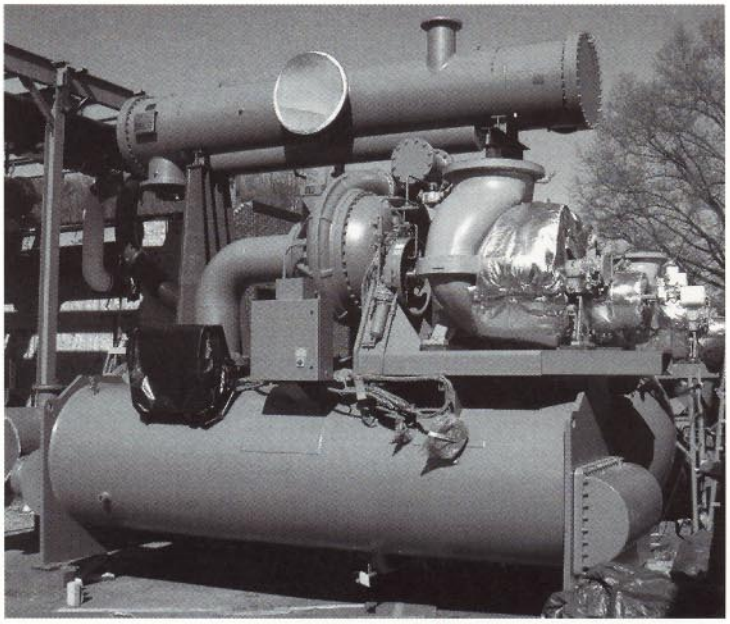
	A	FA	DA	EA	B	AB	CB	FB	C	AC	BC	CC	D	APPROX. NET WEIGHTS LB/KG
"V"	49.62 1260	16.50 419	18.50 470	25.75 654	74.12 1883	23.00 584	21.00 533	51.12 1298	36.62 930	22.00 559	23.62 560	13.50 343	3.0033 76.284	3500 1587



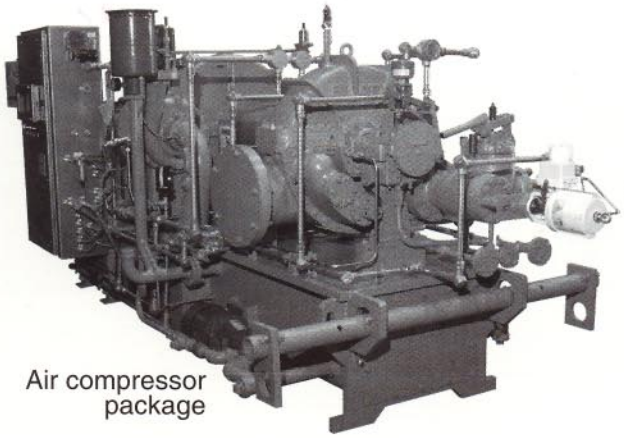
	A	FA	DA	EA	B	AB	CB	FB	C	AC	BC1	BC2	CC	D	APPROX. NET WEIGHTS (TURBINE ONLY) LB/KG
SKV1 6" INLET	89.62 22.76	34.00 864	18.50 470	32.44 824	48.75 1238	23.00 584	18.00 457	30.75 781	37.88 962	22.00 559	15.25 387	15.50 394	13.50 343	2.00 51 TAPERED	4,000 1814

ELLIOTT'S FLEXIBILITY FOR YOUR TURBINE APPLICATIONS

The Elliott YR turbines should be your only consideration for your turbine needs

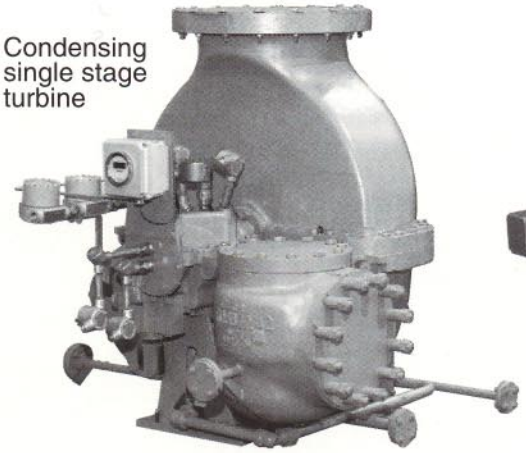


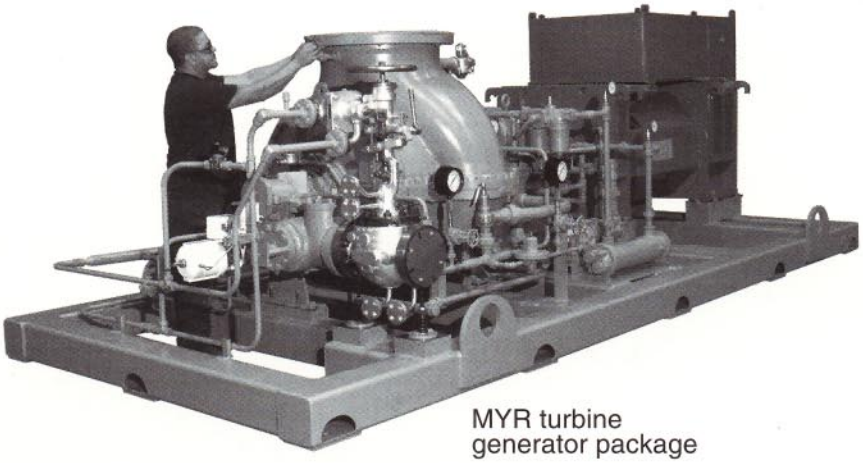
Air conditioning package



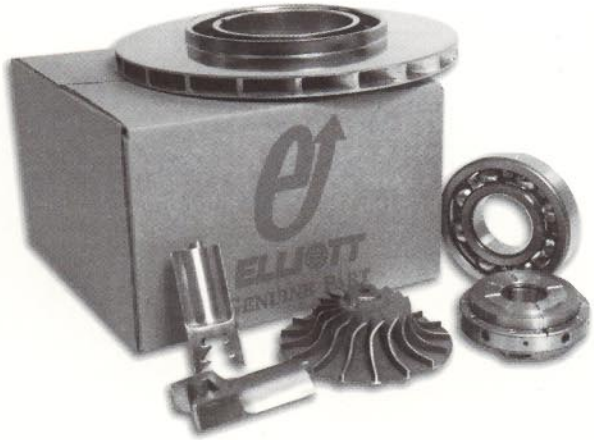
Air compressor package

Condensing single stage turbine





MYR turbine generator package



WORLDWIDE SERVICE NETWORK

All Elliott equipment is designed with the user in mind. The equipment can be installed quickly and easily maintained. The Elliott worldwide service locations are staffed with experienced sales, service engineers, parts specialists and service supervisors.

Installation, supervision, or start-up assistance is available. Rerate programs are another service offered by Elliott. These programs includes re-engineered existing Elliott and other turbomachinery equipment for improved efficiency and upgrade of controls and instrumentation.

MATERIAL SPECIFICATION

Part Name	Frame Size												Material Description	Material Spec
	P	A	B	BH	BHH	C/CH	D/DH	DM	DN	MYR	V	K/J		
Casing Steam/Exh. End and Steam Chest														
Class I		•	•			•	•						High Strength Cast Iron	ASTM A-278 Class 40
Class I 36" & 42" exh.										•			High Strength Cast Iron	ASTM A-278 Class 40
Class III	•	•	•	•	•	•	•	•	•	•		•	Cast Carbon Steel	ASTM A-216 WCB
Class IIIA		•	•	•	•	•	•			•		•	Cast Carbon Molybdenum Steel	ASTM A-217 WC1
Class IIIB				•	•	•	•					•	Cast Chromium-Molybdenum Steel	ASTM A-217 WC6
Class IV				•	•	•	•	•	•	•	•	•	Cast Carbon Steel	ASTM A-216 WCB
Class IVA				•	•	•	•	•	•	•	•	•	Cast Carbon Molybdenum Steel	ASTM A-217 WC1
Class IVB				•	•	•	•	•	•	•	•	•	Cast Chromium-Molybdenum Steel	ASTM A-217 WC6
Rotor, Built-up														
Shaft, Rotor Std 2, 3	•	•	•	•	•	•	•	•	•				Chromium-Molybdenum	AISI 4140
Shaft, Rotor Std 4 & Higher & MYR				•	•	•	•	•	•		•		Nickel-Chromium-Molybdenum	AISI 4340
Disk, Rotor Std 2 & 3	•	•	•	•	•	•							High Strength Steel	ASTM 517, Type B
Disk, Rotor Std 4 & 5, Forged (DYR & MYR)							•	•	•		•		Nickel-Chromium-Molybdenum	AISI 4340
MYR Disk										•			Nickel-Chromium-Molybdenum	AISI 4340
MYR Shaft										•			Nickel-Chromium-Molybdenum	AISI 4340
Rotor, Solid				•	•	•	•	•	•	•	•	•	Nickel-Vanadium-Molybdenum	ASTM A-470 CL4, 7 or 8
Rotor Blades														
Blades	•	•	•	•	•	•	•	•	•	•	•	•	12% Chromium Stainless Steel	AISI 403
Shroud Band	•	•	•	•	•	•	•	•	•	•	•	•	12% Chromium Stainless Steel	AISI 410
Diaframs										•			Ductile Iron	ASTM A339
											•		Carbon Steel	SA516
Diafram Blades										•			12% Chromium Stainless Steel	AISI 403
												•	Stainless Steel	ASTM A-276, Type 405
Reversing Bucket Holder														
Bucket Holder		•	•	•	•	•	•	•	•	•			Carbon Steel Plate	ASTM A-516 Grade 60
Bucket Holder	•										•		Stainless Steel Plate	AISI 410
Stationary Blades	•	•	•	•	•	•	•	•	•	•	•		12% Chromium Stainless Steel	AISI 403
Nozzle Ring														
Drilled & Reamed		•	•	•	•	•	•	•	•	•	•	•	Stainless Steel	AISI 410
Precision cast nozzle	•												Stainless Steel	ASTM A-743 Gr CA-6NM
EB weld nozzle				•	•	•	•	•	•	•	•	•	Stainless Steel	ASTM A-276, Type 405
Milled nozzle				•	•	•	•	•	•	•	•	•	Stainless Steel	ASTM A-276, Type 405
Packing Cases														
Class I		•	•	•	•	•	•	•	•	•			Ductile Iron	ASTM A-536 Gr 60-40-18
Class III	•		•	•	•	•	•	•	•	•			Ductile Iron	ASTM A-536 Gr 60-40-18
Class III		•										•	Carbon Steel	ASTM A-216 WCB
Class IIIA		•	•	•	•	•	•	•	•	•	•	•	Carbon-Molybdenum Cast Steel	ASTM A-217, Grade WC1
Class IIIB				•	•	•	•				•	•	Cast Chromium-Molybdenum Steel	ASTM A-217 WC6
Class IV											•		Carbon Steel	ASTM A-216 WCB
Class IVA											•		Carbon-Molybdenum Cast Steel	ASTM A-217 WC1
Class IVB											•		Cast Chromium-Molybdenum Steel	ASTM A-217 WC6
Bearing Cases	•												Cast Iron	ASTM A536 Gr 65-45-12
		•	•	•	•	•	•	•	•	•	•		Cast Iron	ASTM A-278 Class 30
				•	•	•	•	•	•	•	•	•	Carbon Steel	ASTM A-216 WCB
Bearings														
Ball	•													
Retainer				•	•	•	•	•	•	•	•	•	Cold Rolled Steel	AISI 1018
Liner		•	•	•	•	•	•	•	•	•	•	•	Bonded Babbitt	SAE 12
Bearing Housing Oil Seals		•	•	•	•	•	•	•	•				Low Carbon Steel Tubing	ASTM A-108, Grade 1018
Aluminum	•												Aluminum Alloy	ASTM B-211 alloy 2017T4
Aluminum											•	•	Aluminum Alloy	ASTM B26 Alloy 443.0
Aluminum				•	•	•	•	•	•	•			Aluminum Alloy	ASTM B-209 Alloy 6061-T6
Governor Valve & Seat														
Valve	•	•									•	•	13% cr Steel	AISI 416
Seat											•	•	High Alloy Stl.	17-4PH
Seat	•												13% cr Steel	AISI 416
Valve and Seat		•	•	•	•	•	•	•	•	•			Nickel Alloy, ductile cast iron	D2, Ni-resist
Stem		•	•	•	•	•	•	•	•	•			304 Stainless Steel	ASTM A-479
Stem	•										•	•	13% CR Steel Nitrided	AISI 416
Trip Valve & Seat														
Valve, Class III	•												Stainless Steel	ASTM A743 Gr CA-6NM
Valve, Class I & III		•											13% cr Steel	AISI 416
Valve, Class I & III			•	•	•	•	•	•	•	•			Carbon Steel	AISI C-1018
Valve, Class I & III				•	•	•	•	•	•	•			Cast Steel for 6" inlet	ASTM A-216 Grade WCB
Valve, Class IIIA & IIIB		•	•	•	•	•	•	•	•	•			Nickel-Chromium-Molybdenum	AISI 4340
Stem		•	•	•	•	•	•	•	•	•			Chromium-Molybdenum	AISI 4140, Flash Chromed
Seat, Class I		•	•			•	•						High Strength Cast Iron	ASTM A-278, Class 40
Seat, Class III	•	•	•	•	•	•	•	•	•	•			Cast Steel	ASTM A-216 Grade WCB
Seat, Class IIIA		•	•	•	•	•	•	•	•	•			Cast Carbon Molybdenum Steel	ASTM A-217 WC1
Seat, Class IIIB				•	•	•	•	•	•	•			Cast Chromium-Molybdenum Steel	ASTM A-217 WC6

ELLIOTT®
EBARA GROUP

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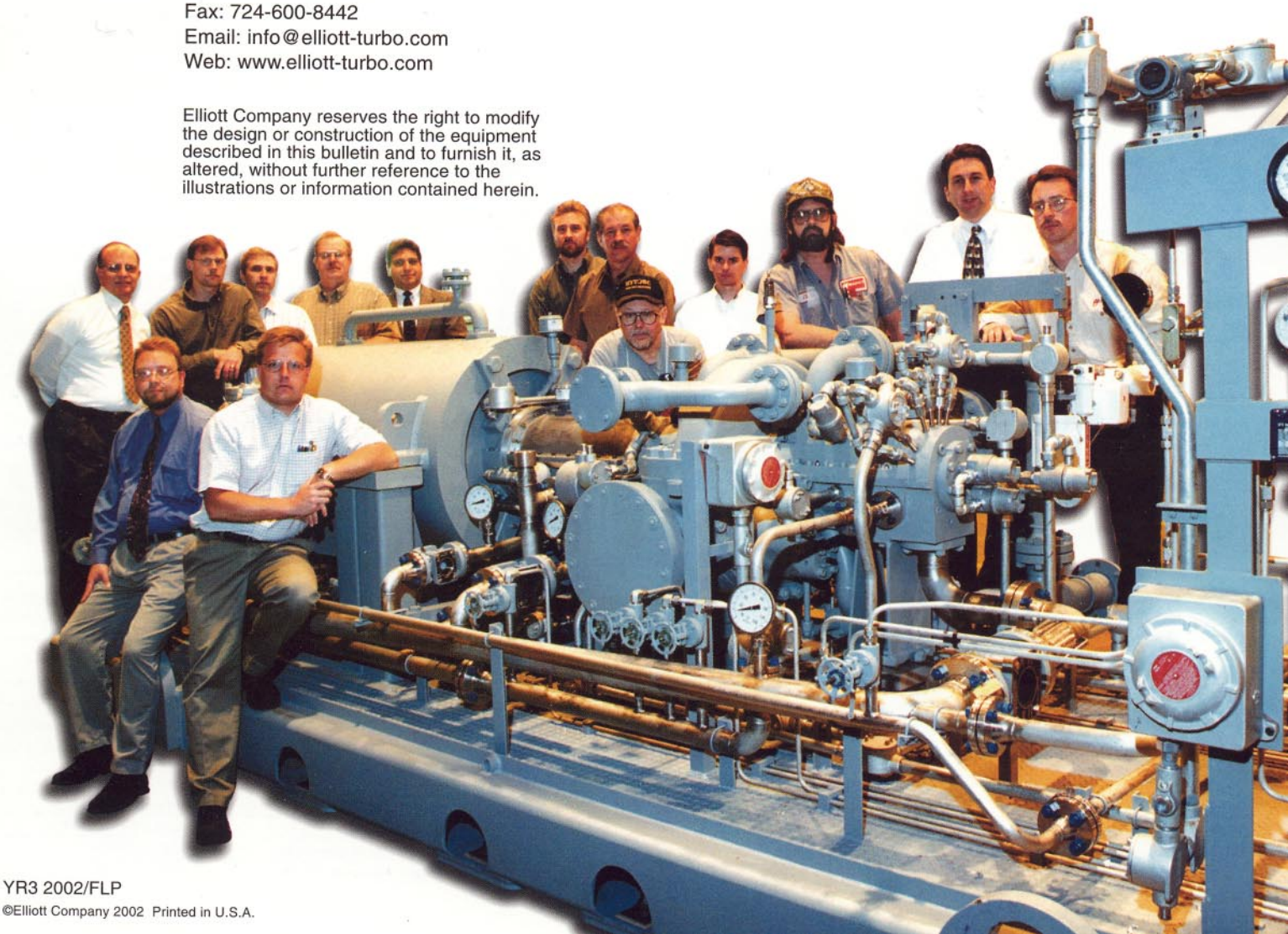
Elliott Company reserves the right to modify the design or construction of the equipment described in this bulletin and to furnish it, as altered, without further reference to the illustrations or information contained herein.



YR3 2002/FLP