

Rpt. 17 (a)

6 SEP 1960

Date of writing Report 19th May, 1960 Received London _____ Port KOBE
Survey held at Osaka No. of visits 6 First date 4th Nov., 1959 Last date 9th Jan., 1960
No. FE-7764

REFRIGERATED CARGO INSTALLATION REPORT ON REFRIGERATING MACHINERY

Machinery made by Sabroe Co., of Japan Ltd. Machine Nos. 330106, 330107, 330108 When made Feb., 1960
Intended for Yard No. or Ship's Name Ship No. 836 m.v. "SUMIDA MARU"
Built or building at Yokohama By whom Mitsubishi Nippon Heavy Ind. Ltd.,
OWNERS Nippon Yusen Kaisha, Tokyo Yokohama Shipyard & Engine Works.
Primary refrigerant Dichlorodifluoromethane Medium for cooling chambers (brine, primary refrigerant, etc.) Cold air circulation

PARTICULARS OF REFRIGERATING MACHINES OF EACH SIZE (Including machines (if any) for cooling liquid refrigerant)

RECIPROCATING TYPES

(1) No. of machines 3 No. of cylinders per machine 3 (2LP, 1HP) Single or double acting Single Single or two-stage Two
Diameter of cylinders 150 mm Vertical, horizontal or Vee Vertical Diameter of piston rod if double acting -
No. of cranks 3 Stroke 125 mm Speed of machines as fitted: Maximum R.P.M. 500 Minimum R.P.M. 250
Single speed, set speeds or variable speed Set speeds Clearance volume as percentage of swept volume 3.7
Swept volume of machine(s) at maximum R.P.M. 134, 800 cub. inches per minute How driven (direct, V belt, gearing, etc.) V belt
Prime Movers (steam engine, oil engine, electric motor, etc.) Electric Motor B.H.P. 30 Maximum R.P.M. 1800

(2) No. of machines - No. of cylinders per machine - Single or double acting - Single or two-stage -
Diameter of cylinders - Vertical, horizontal or Vee - Diameter of piston rod if double acting -
No. of cranks - Stroke - Speed of machines as fitted: Maximum R.P.M. - Minimum R.P.M. -
Single speed, set speeds or variable speed - Clearance volume as percentage of swept volume -
Swept volume of machine(s) at maximum R.P.M. - How driven (direct, V belt, gearing, etc.) -
Prime Movers (steam engine, oil engine, electric motor, etc.) - B.H.P. - Maximum R.P.M. -

Material of compressor crankshafts Steel forgings Have they been manufactured and tested in accordance with the Rules and/or Secretary's letters? Yes
Tensile strength 62.3, 62.3 & 62.7 kg/mm² Have other important steel forgings and castings been manufactured and tested in accordance with the Rules? Yes
Are safety devices fitted to compressors in accordance with the Rules? Yes Are compressors arranged for multiple-effect compression? No

OTHER TYPES (e.g., Centrifugal, steam jet, etc.)

(3) _____

Where two machines only are provided, are all the working parts interchangeable? -
Is provision to be made for liquid refrigerant sub-cooling? Yes If so, state method. Liquid discharge cooled by gas flow in interstage cooler, temperature of which controlled by expansion valve in liquid branch line.

PARTICULARS OF GAS CONDENSERS OF EACH TYPE AND SIZE

No. of shell-and-tube type 3 No. of shells in each 1 No. of tubes per shell 158 Material and thickness of tubes Alumi-brass 1.24 mm
Cooling medium and No. of passes Sea water 4 passes No. of tubes each pass 39/40 Internal diameter of tubes 13.39 mm
Total No. of tubes per condenser 158 Total external surface of tubes in each condenser 15.3 sq.M.
No. of coil-in-casing type - No. of casings - No. of coils each casing - Material, external diameter and thickness of coils -
External surface of each coil - Cooling medium and No. of passes -
Total external surface of coils each condenser - Can each coil be readily shut off or disconnected? -
Other types -

PARTICULARS OF EVAPORATORS (BRINE COOLERS) OF EACH TYPE AND SIZE.

No. of shell-and-tube type - No. of shells in each - No. of tubes per shell - Material and thickness of tubes -
No. of passes of brine - No. of tubes each pass - Internal diameter of tubes -
Total No. of tubes per evaporator - Total external surface of tubes in each evaporator -
No. of coil-in-casing type - No. of casings - No. of coils each casing - Material, external diameter and thickness of coils -
External surface of each coil - Total external surface of coils in each evaporator - Can each coil be readily shut off or disconnected? -
Other types -

OTHER COMPONENTS, ETC.

No. of oil separators 6 No. of strainers 7 No. of liquid receivers 3 No. of driers 3 No. of brine heaters -
Other pressure vessels, give particulars 3 interstage coolers
Particulars of air cooler coils ~~200 cooling coils~~ Plain coils, external diameter 34 mm Thickness 3.2 mm Material Seamless steel pipe
Extended surface coils, internal diameter - Thickness - Material -
Pitch of fins or plates - Dimensions of fins or plates - Total extended surface per foot of pipe -
Air cooler coil assemblies, total No. 8 Length of pipe and No. of coils of each size 351.5 M. 6 coils per air cooler
Can each coil be readily shut off or disconnected? No

Cooling grid sections, total No. and length of pipe of each size -
Primary refrigerant piping, internal diameter and thickness of each size -
Material - How manufactured -

Have all components of the refrigerating plant been constructed strictly in accordance with the Rules and approved plans? Yes
Has the spare gear required by the Rules been supplied? Yes Where additional spare gear has been supplied a list is to be attached to the Report.
The foregoing is a correct description of the refrigerating machinery.

PRESSURE TESTS AT WORKS						
DESCRIPTION	Working Pressure	Hydraulic Pressure	Date of Test	Air Test Pressure	Date of Test	Stamped
Compressor cylinders	10.5 kg/cm ²	24.5 kg/cm ²	12-12-59	14 kg/cm ²	12-12-59	YK
Compressor crankcases	7 kg/cm ²	14 kg/cm ²	12-12-59	10.5 kg/cm ²	12-12-59	YK
Oil separators, oil rectifiers	10.5 kg/cm ²	24.5 kg/cm ²	21-12-59	14 kg/cm ²	21-12-59	AM
Filters	10.5 kg/cm ²	} Not tested at Makers' Works				
Driers	10.5 kg/cm ²					
Strainers	10.5 kg/cm ²					
Stop valves and connections	10.5 kg/cm ²	24.5 kg/cm ²	12-12-59	14 kg/cm ²	12-12-59	YK
Liquid receivers	10.5 kg/cm ²	24.5 kg/cm ²	21-12-59	14 kg/cm ²	21-12-59	AM
Condenser shells & tubes	10.5 kg/cm ²	24.5 kg/cm ²	21-12-59	14 kg/cm ²	21-12-59	AM
Evaporator (brine cooler) shells or coils	-	-	-	-	-	-
Condenser headers and connections	-	-	-	-	-	-
Condenser coil water ends	16 M. head	7 kg/cm ²	21-12-59	-	-	AM
Evaporator headers and connections	-	-	-	-	-	-
Evaporator coil casings or brine ends	-	-	-	-	-	-
Air cooler coil assemblies	10.5 kg/cm ²	24.5 kg/cm ²	9-1-60	14 kg/cm ²	9-1-60	JN
Chamber grid sections	-	-	-	-	-	-
Float regulators	-	-	-	-	-	-
Brine heaters	-	-	-	-	-	-
Primary refrigerant piping	-	-	-	-	-	-
Other pressure parts - Interstage coolers	10.5 kg/cm ²	24.5 kg/cm ²	21-12-59	14 kg/cm ²	21-12-59	AM

PLANS: Drawing No. and date of approval of each plan concerned. Approved 11-12-59, and 9-2-60 London for amended machinery specification.

Compressors, crankshaft	8C	Crankcases	3C	Cylinders	5A
Filters	6103B	Separators	7771A	Liquid receivers	8996-2
Evaporators	-	Strainers	10646, 6891, 10748	Float regulators	-
Condensers	8996-2	Driers	6103B	Brine heaters	-
Air coolers	10418B				
Other pressure parts	Interstage coolers 9097A				

General remarks (state quality of workmanship, opinions as to class, etc.)

The refrigerating machinery has been constructed under special survey in accordance with the requirements of the Rules, approved plans and Secretary's letters.

The materials and workmanship are good.

It is recommended this refrigerating machinery is eligible for the class notation of 4Lloyd's RMC with temperature notations when satisfactorily installed on board the ship in accordance with the requirements of the Society's Rules.

PARTICULARS OF MACHINERY FOR REGISTER BOOK

No. of units	3	Prime Movers	Electric Motor
Total B.H.P. of all compressor prime movers	90	Refrigerant	Dichlorodifluoromethane
Makers	Sabroe Co., of Japan Ltd.	Date of construction	1960

MACHINERY PARTICULARS:

3-3 Cyl. SA Com. Compressors 150 & 150 x 125mm x 500 r.p.m.
3 - S & T condensers

SURVEY FEE (Based on measured cubic capacity on completion of installation.)

Construction £52,600.-
Travelling expenses £ 3,400.

Fee applied for, JUN - 6. 1960
Received by me, 19

Date of Committee
Minute

FRIDAY - 7 OCT 1960
See yma 33ii

H. Palanchi
J. Kojima, J. Nonomura, K. Tabuchi & A. Murao
Surveyor to Lloyd's Register

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