PENGENALAN KEPADA

SISTEM GAS PERUBATAN BERPAIP

di dalam

HOSPITAL

STANDARDS

1. Users
2. Health Technical Memorandum No. 2022 (HTM 2022) Published by DHSS, UK
3. Past experienced

Why do we need standards?

1. Safety
2. Knowledge
3. Organisational change
4. Minimum safety performance
5. Specific procedures

What is HTM?

HTM is a document for ***guidance*** *to design*

Medical Gas Pipeline System and deal with:-

1. Positioning of terminal units
2. Positioning of zone valves / line valves
3. Gas flow rate required at terminal units
4. Gas flow rate required at specific areas

Continue ……..

What is HTM?

HTM is a document for ***guidance*** *to design Medical Gas Pipeline System and deal with:-*

5. Limits of pressure drops in the system
6. Positioning support and protection of pipes
7. Source equipment such as manifolds, pumps, compressors, ect.
8. Alarm systems, its locations, signals, ect.

History of HTM

HTM 22 : 1st published in 1972

Revised in 1972

C11 1st published in 1989

HTM 2022 = [HTM 22 + C11]

1st published in 1995

Revised in 1997

What is C11

C11 is a document contains **Purchasing Specification**. It replace a lot of details found in the tender specification. It is a **Model Engineering Specification**.

NATIONAL HEALTH SERVICE
MODEL ENGINEERING SPECIFICATION

C11

MEDICAL GASES

Produced By Engineers In The DHSS & NHS (In Association With Installation Contractors And Equipment Manufacturers) Under The Guidance And Co-ordination Of The Regional Engineers Association.

The co-ordinating Region for this specification is:-

WESSEX REGIONAL HEALTH AUTHORITY
'HIGHCROFT'
ROMSEY ROAD
WINCHESTER.

Issue: January 1990

GENERAL SAFETY

1. **Identity** – non detachable gas-specific connection(TUs,connectors,etc)

2. **Adequacy** – accurate assessment of demand and appropriate of plant selection

3. **Continuity** – continuity of supply is achieved,duplicate component,emergency or reserve supply,with alarm system

4. **Quality** – correct supply of gases and maintain cleanliness throughout the installation and complete T&C

Medical Gas Distribution System

1. Utilised in a life support application

2. To transport gas or medical vacuum from the source of supply to the point of use

3. The pipeline design ensure the flow rates and pressures remain consistent at the point of use,regardless or the demand placed upon the system

Gases

1. Oxygen
2. Nitrous Oxide
3. Entonox
4. Medical air
   - 4 Bar
   - 7 Bar or 10 Bar (surgical air)
5. Vacuum
6. Anesthetic Gas

Distribution System

Four basic elements:

- Point of use delivery connection(Terminal Units)
- Pipeline distribution system and valve
- Source of supply
- Monitoring and control equipment

Distribution System

Terminal Units

- Terminal Units(Outlets)

  # wall
  # bedhead
  # pendant

Distribution System

2a. Pipeline

- # cleaned and degreased copper tubing pipe

2b. Valves

- # area valves
- # zone valves
- # line valves

Distribution System

3. Plant
   - manifold
   - plant

Medical Gas Pipe Line System

Cylinder Capacity:

1. Oxygen 6,540 liters
2. Nitrous Oxide 8,900 liters
3. Entonox 4,740 liters
4. Medical Air 5,550 liters

Source Equipment/Supply

MEDICAL AIR:

4 Bar

7 Bar or 10 Bar

…..Cylinder manifold + ESM

OR

Air compressor plant + ESM

Source Equipment

ANESTHETIC GAS

….Anesthetic Gas Scavenging System(AGSS)

Distribution System

Alarm and Monitoring Control

area

plant

@operating alarm and emergency alarm

TESTING AND COMMISSIONING

Test and check on pipeline system (after complete installation)

TESTING AND COMMISSIONING

Test and check on pipeline system

(after complete installation)

1. Test for leakage on each pipeline
2. AVSUs leakage test,closure,zoning
3. Cross connection,flow,pressure drop,mechanical function,gas specificity of NIST connectors
4. Performance tests of the pipeline system
5. Functional test of all supply system
6. Alarm/warning system

Testing and Commissioning

Test before use

1. Particulate contamination
2. Gas Identities
3. Gas quality
4. Labeling of AVSUs & to include gas label,flow direction arrow and area served

MEDICAL GAS PIPE LINE SYSTEM

PERTANYAAN

DAN

Sekian

Terima kasih